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The Outlook

Parliamentary Preoccupations

RARELY in its long history has this country been faced simultaneously with so many puzzles as those confronting it at present. Arising mainly out of the desperate economic situation and the dire necessity for self-help, the position is made all the more difficult by the fact that our leaders have failed to unite the nation, as recent events have clearly shown.

First and foremost, there is the question of defence and the reduction in our armed forces. That reductions are necessary is obvious, and the fact is not disputed by anyone. But, as Lord Croft so truly said, armed forces have no purpose unless they are a real deterrent because of their readiness to fight. It would also be well to ponder his reminder that twice within a quarter of a century our weakness in defence and apparent love of ease encouraged an aggressive Power to attack us.

Readiness is not attained by rapid demobilization if that is accompanied by slow recruitment, and unfortunately the R.A.F. is not doing too well in the matter of volunteers (the conscripts are not likely to improve the efficiency, and the mainstay must remain the "regulars"). Of volunteers for aircrew duties there is no lack, but the same cannot, unfortunately, be said of other branches. Viscount Trenchard, we are glad to note, returned to the suggestion which he has previously made: that if every man who had served three, four or five years in one of the three Services were assured of subsequent employment in civil service under the Government, the picture would be very different. We hope the Air Ministry will use its influence to bring that point home to the Government. Its previous effort to attract the men by dangling carrots, in the form of separate bedrooms, books, reading lamps and so forth, has failed. An assurance of civil employment after expiration of service would be much more likely to attract the right type of man. And there should be plenty of openings in the nationalized civil services.

Defence Priorities

THERE is some little satisfaction to be derived from the statement of priorities made by the Minister of Defence in "another place." Mr. Alexander put defence research first, the "maintenance of the structure of the R.A.F. and its initial striking power" second, the Navy third, and the Army fourth. With that assessment of relative importance few would quarrel. If we are to have any hope of preparedness, all the latest devices which science can suggest must be developed, rapidly and thoroughly. In any future war the R.A.F. will be the first Service to go into action. Already in the recent war the Royal Air Force became out first line of defence. Guided missiles may alter the initial stages of a war, but they will not render an efficient air force superfluous. The Navy will again be needed to protect our sea communications, but, as Lord Newall pointed out, it cannot do so alone and must be helped by close co-operation from our air forces. Lord Newall's plea for a consideration of our defence policy as one whole, now that we have a Minister of Defence, was very timely, and should be heeded. Unfortunately, Mr. Alexander has not so far given any convincing proof that he is the right man to hold the balance between the conflicting claims. His recent statement was too vague, and rather too much concerned with the Navy, to be entirely reassuring. The same may be said of the speech by the First Lord of the Admiralty, and it fell to the Minister of Civil Aviation to reply for the Government concerning the R.A.F. and the Army.

R.A.F. Per M.C.A.

ONE cannot help having a great deal of sympathy with Lord Nathan. It was scarcely fair, although presumably unavoidable, to put him up as the Government spokesman on subjects with which he cannot possibly have had time thoroughly to familiarize himself. Being Minister of Civil Aviation is a full-time job, and Lord

Nathan has but recently returned from a long air tour of the Far East, Australia and New Zealand. If, therefore, his reply lacked the ring of authority, the fault is scarcely his. With engaging frankness he admitted: "That is the information with which I am furnished, but I am bound to tell the noble Lord that in some respects it is beyond my technical comprehension." The "information" to which Lord Nathan referred, and which he had just given in reply to Lord Newall, was to the effect we are no longer proceeding gradually by short steps but are looking very far ahead. The centrifugal jet engine developed from the Whittle design is being supplemented by axial-flow jets and compound engines, *which will represent an enormous advantage over the older types.* The italics are ours. Lord Nathan also said, again obviously from "the information with which he had been furnished," that there are now on the stocks new Servic aircraft, both fighters and bombers, which employ the most advanced aerodynamic conceptions and the use of these engines, and which, when they come into service will, in the view of the Government, ensure that the Royal Air Force and the Royal Navy will remain ahead of the air forces of the world.

The operative sentence is "when they come into service." America is forging ahead and is rapidly overtaking us in the matter of jet-propelled aircraft, large and small, and there is certainly no room for complacency in spite of the certainty that in any future war the two nations would again be joined.

Club Flying

AFTER a post-war period of struggles against almost overwhelming odds, the flying-club movement has received a serious set-back by the delayed publication of the Whitney Straight report at a time which could scarcely have been less propitious. The Whitney Straight Committee, the Informal Light Aircraft Committee under Mr. Peter Masefield's chairmanship, and the Ultra Light Aircraft Association are not to blame. Their reports were submitted some time ago, but the Minister of Civil Aviation, to whom the recommendations were submitted, was away for several weeks on a tour to Australia and New Zealand and had no opportunity to study them before his departure. It almost seems as if the fates were determined to put every possible obstacle in the way of British light plane progress.

The title given to the Whitney Straight Committee (The Special Advisory Committee on Private Flying) was not, as things are turning out, the most helpful. Certain sections of the community will probably jump to the conclusion that to subsidize private flying means that the taxpayer is being asked to foot the bill for the benefit of individuals who could well pay for their pleasure, whereas the whole scheme is visualized as a co-operative effort to enable enthusiasts to learn to fly at a cost of not more than £1 per hour. Club Flying might have been a better title.

Lord Nathan is known to be sympathetic, but it remains to be seen whether he can convince the Government and the Treasury of the national importance of the movement. The Memorandum submitted by the Society of British Aircraft Constructors convincingly shows the great effect which the pre-war club movement had on the fortunes of a number of aircraft firms, and how important is a home market for the development of a healthy export trade. Even the present crisis should not invalidate that argument.

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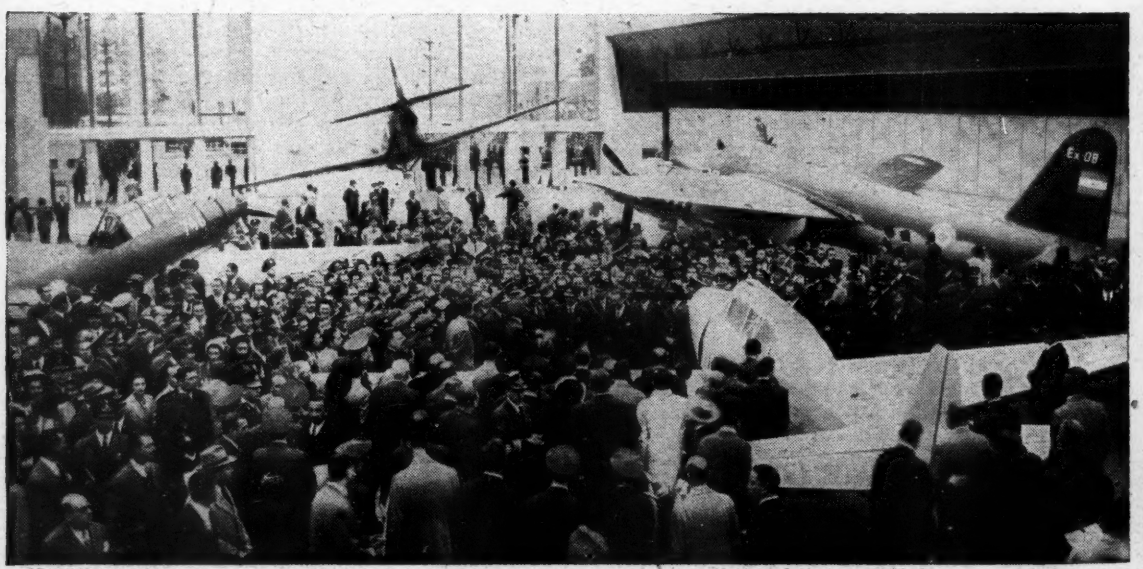


ARGENTINA WAY: The Annual Argentine "Semana de Aeronautica" was inaugurated on September 22nd, and was inspected, as our picture shows, by General J. D. Perón. The aircraft on the left is a DL22 (Cheetah 25); in the centre is the Derwent-powered Pulque, on the right the Calquin (two Pratt and Whitney) and in the foreground the Colibri (Cirrus Major II). All are national products.

A New British Radio Compass

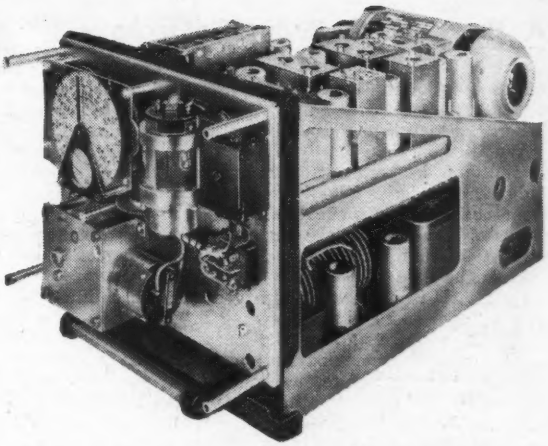
Standardized for the R.A.F. and Available for Civil Aircraft

MENTION of the new G.E.C. Radio Compass was made in our review of the S.B.A.C. Exhibition at Radlett but, since this device is the first of its kind to be wholly designed and manufactured in this country, it merits a fuller description, particularly since it is to become standard equipment for the Royal Air Force.

Developed by the Salford Electrical Instruments, Ltd., division of G.E.C. in conjunction with the R.A.E., Farnborough, the compass, when shown at Radlett and Radiolympia, excited considerable attention. In particular, the major airline companies evinced a great deal of interest, and there is every intention on the part of the manufacturers to make the equipment available, possibly in a modified form, to commercial users.

The name "Radio Compass" implies the function of the equipment. Receiver, aerials and circuits combine to produce on a 360-degree dial an indication of the bearing of the station or beacon being received. Thus it is possible to home, to obtain fixes, or to obtain bearings at regular intervals for normal D.R. navigation. Physically, the equipment comprises a receiver, a loop aerial, sense aerial, and twin control units (one each for navigator and pilot), together with a large, clear "compass" dial for the navigator, and a smaller repeater for the pilot.

So many refinements are incorporated in these essential units that only the more striking items can be detailed. Beginning, appropriately, with the loop aerial, this now belies its name, for it has been reduced to a flat lozenge-shaped coil only a few inches in depth, with iron-dust cores. For retrospective fitting to aircraft this loop is enclosed in a housing shaped rather like a flat-fish; the aerodynamic drag of this housing is of the order of one-third that of the previously used standard 10in loop. For incorporation in new aircraft a "dish-pan" type of housing is used, and the loop aerial is accommodated inside the aircraft skin so that there is no external projection.



Receiver unit with cover removed to show the neat interior arrangement. The rotary transformer can be seen at the rear.

Units making up a complete aircraft installation. They comprise, left to right, first control box, junction box, navigator's large-diameter bearing indicator, the flat aerial unit with motorised drive, and, below it, the cathode follower unit, second control box, pilot's repeater indicator, and receiver unit.

Automatic Direction Finding

In the design of the receiver, which covers the frequency-range of beacons and broadcasting stations, ease of servicing has been the guiding line. Unit construction has been carried to the stage in which the whole equipment can be dissembled into ten units, including controls, amplifiers, wavechange and condenser drive, generator and filter unit, etc. Twenty-one valves are employed, all of approved type and easily replaceable, with filaments supplied directly from the aircraft D.C. supply voltage. The main control switch on the control panel gives the normal facilities of a receiver with either automatic or manual volume control, together with automatic direction finding ("A.D.F.") and a position marked as "LOOP."

Use of the receiver in the ordinary way requires no specific comment, but reference should be made to the ingenious arrangements for tuning. When the receiver is switched on, an optically enlarged frequency scale is projected with considerable brilliance on to the kidney-shaped ground-glass screens of each of the control boxes. Motor-driven tuning is employed, and it is necessary only to turn the tuning knob slightly to left or right to decrease or increase frequency. The servo drive is of proportional type whereby the speed of tuning is dependent upon the amount by which the knob has been turned.

Nothing has been sacrificed for compactness in the control panel, and facility in the operation of this type of tuning control is claimed to be very rapidly acquired. When the required broadcast station or beacon has been tuned-in (and in this connection it should be stressed that a special ground station is not required, any suitable beacon broadcasting station can be used) a bearing may be obtained by switching the main control to "LOOP" and operating another similar servo control for driving the loop until the null position has been found aurally. A check for sense is made in the usual way by shifting

A New British Radio Compass . . . . .

off the minimum signal position and depressing a sense button. When switched to "A.D.F." the signal itself drives the loop into the minimum signal position.

Whether on "LOOP" or on "A.D.F.," all movements of the loop are transmitted to the navigator's and pilot's indicators by servo followers. In addition, the quadrantal error correction is made mechanically by pre-setting the travel of a cam in such a way as to retard or advance the servo follower by the required number of degrees in relation to the loop.

On "A.D.F." the loop is driven through a differential gear by two small motors running in opposition. In the no-signal or null condition the motors run at equal speed so that the loop remains stationary. When a station is tuned-in and, therefore, a signal is present, one motor is speeded up and the other slowed down. As a result there is a drive in one direction and the loop is rotated. As it approaches the null, the motors approach the condition of equal and opposite speed, and at the appropriate point the loop remains at rest. The bearings obtained in this way are accurate to one degree, or better than one degree on strong signals. Incidentally, while on "A.D.F." the loop motors run continuously so that no errors due to starting conditions are introduced.

One of the two control panels, or boxes. In the "kidney" window above the central dial appears an illuminated tuning scale.

It will have been noted that there are no mechanical remote controls. A cathode - follower valve-unit, which is employed to match the loop to the connector cable, removes any possible electrical limitations. Thus complete flexibility of installation is achieved.

The approximate weights of the components are:—

Receiver, 30 lb 12 oz; loop assembly, 22 lb; two control boxes, 8 lb 2 oz; junction box, 3 lb 8 oz; cathode follower, 1 lb 9 oz.

For Safer Landing

New Anti-blowout Inner Tube by Goodyear

ANYONE who has experienced a punctured tyre on an aircraft will readily agree that, at best, it is an uncomfortable matter: at worst, it is lethal. It is, therefore, of considerable interest that the Goodyear Tyre and Rubber Co. (Gt. Britain) Ltd., have developed what is called a Dual Seal tube to provide some degree of protection against the hazards occasioned by punctures or blow-outs.

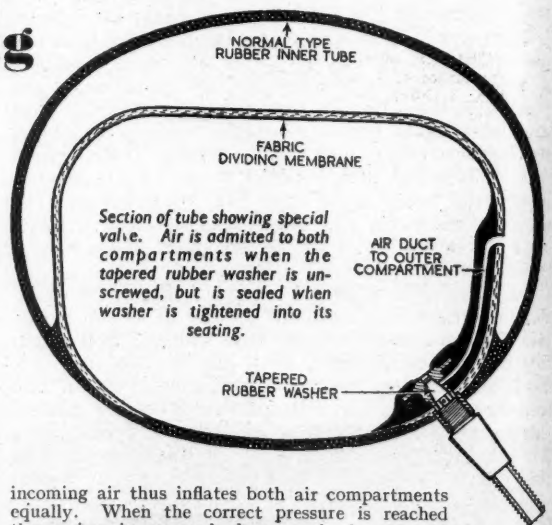
In effect, the new tube is two tubes in one, and, consequently, the weight increase is something of a penalty. Thus it is that the device will find application chiefly in nosewheel tyres although, in the smaller aircraft sizes, it might be employed for main wheels as well. Certainly the results of a nose-tyre blow-out are likely to be considerably more hazardous since experience has shown that this contretemps can involve wrapping the tyre around the strut with a consequent likelihood of that member's sudden collapse.

What the Dual Seal tube aims at achieving is the maintenance of enough rolling radius for a sufficient time for the aircraft to be brought safely to a standstill. This implies holding sufficient pressure not only to keep the tyre fully bedded on the wheel rim but also to keep the tyre inflated to at least half its normal pressure.

As may be seen from the accompanying detail sketch, the tube is internally divided into two quite separate compartments. The outer wall of the tube is of normal form, but the second inner wall is a continuous membrane of tough, two-ply fabric cemented to the inside flanks of the tube proper. When the outer wall suffers a puncture the pressure maintained in the inner compartment causes the fabric membrane to stretch and expand to the normal profile, so bridging the aperture—whether it be a large gash or a small hole—and thus keeping the tyre in a usable state, albeit that state is one only of emergency usage.

The unit which makes this form of tube possible is, of course, the special valve. A normal type valve is housed in a casing which screws into a socket cemented into the tube. From the side of this socket a small duct leads to the outer air space, whilst at the socket head is the entry to the inner air space. The casing which houses the conventional non-return valve terminates with a tapered rubber washer in the form of a truncated cone, beneath which are apertures leading to the inflation valve.

When the tube is being inflated, the casing is unscrewed slightly from the socket; enough, in fact, to allow clearance between the tapered washer and its hollow-cone seating. The incoming air thus inflates both air compartments equally. When the correct pressure is reached the casing is screwed down and the tapered washer is forced into its seating so sealing both compartment inlets. By this means the only air path between the tube compartments is closed, and a puncture of the outer wall will not affect the maintenance of pressure in the inner space.



Section of tube showing special valve. Air is admitted to both compartments when the tapered rubber washer is unscrewed, but is sealed when washer is tightened into its seating.

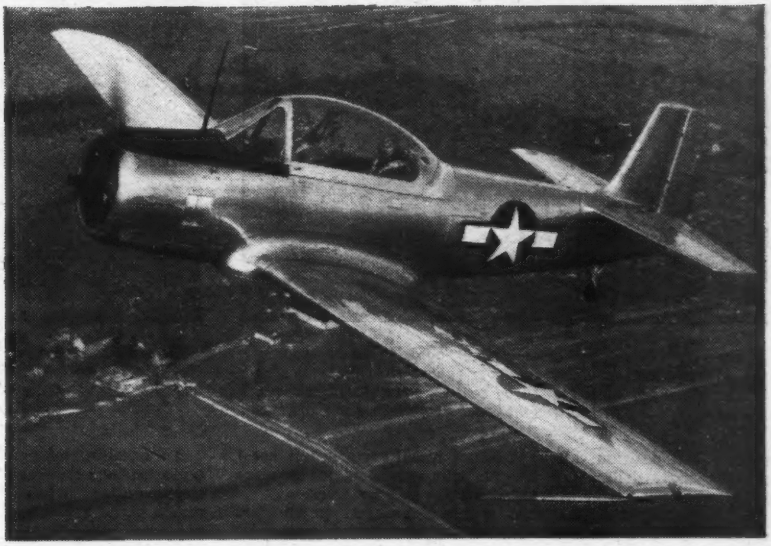
At the moment these tubes are being made only to Ministry order for 24×7.25/12 tyres, but should a demand be found other sizes will be manufactured. They would, too, we feel, be a useful application in the automobile world although the differing requirements would, perhaps, call for a modified form.

B.E.A. MAIL EXPERIMENTS

THE British European Airways Experimental Helicopter Unit has assembled at the Westland Aircraft Company's airfield at Yeovil, Somerset. Experiments will continue until early next year during which time W/C. R.A.C. Brie, Officer in Charge of the Unit, and his four pilots, J. G. Theilmann, G. A. Ford, J. A. Cameron, and J. S. Fay, will fly the helicopters to selected landing fields in the West country. The team will evolve safety procedures and build up schedule information for the second stage of the experimental operations. The first stage will also be useful for familiarization with the system and the area. The second stage will begin in January, and with the co-operation of the G.P.O. will involve the collection and delivery of dummy mail, to a fixed schedule. The unit will aim to keep to within half a minute of the schedule.

"Functional" Trainer

New Fairchild with Standardized U.S. Navy Cockpit Layout



Exteme neatness characterizes the design of the XNQ-1. Note particularly the clear-vision canopy, and the installation of the Lycoming engine. Power operation is provided for the canopy.

By ROY CROSS

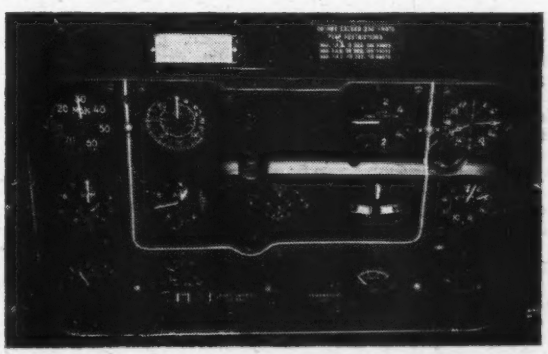
ACCEPTANCE of the Fairchild XNQ-1 all-metal primary trainer for U.S. Navy trials marks a new idea in basic flight training which is spreading to the U.S. Air Forces and abroad. The XNQ-1 differs radically from previous machines of the same class on two main scores: First, it is more complex than any previous primary type; and secondly, it is one of the first aircraft to feature the U.S. Navy standardized and "functional" cockpit layout.

Presumably, the Fairchild, if accepted for Service use, will replace the North American Texan "advanced combat trainer" in which U.S. Navy trainees are now receiving primary instruction. The new Navy accelerated training programme is based upon a successful initial flight course carried out on Texans by one hundred students at the Corpus Christi Naval Air Training Base, starting last March. In practice, the task of learning to fly on such a complicated type as the Texan has apparently not proved unduly formidable.

Both the Texan and the XNQ-1 have a retracting undercarriage, flaps, controllable-pitch airscrew, full instrumentation for night flying, and radio; in addition, the XNQ-1 has a cockpit layout which is basically the the same as those of the new Navy "combat" types, all of which employ the standardized cockpit.

With the new "primary" replacing the old "intermediate" types, a further trainer category has been created in the form of the North American XSN2J-1 "intermediate" trainer, which approximates to the operational types of not very many years ago, having a top speed of 270 m.p.h., a 1,100 h.p. engine, and a full armament complement, including rockets. It seems that future Navy training will be in three clear steps—Fairchild XNQ-1, North American XSN2J-1, and then on to operational types such as the AD-1 Skyraider. Concerning jet fighters, the XSN2J-1 stage, may be cut out to make way for intermediate tuition on such types as the Ryan Fireball.

In general conception, the Fairchild resembles a lighter, simpler, cleaned-up Texan. Layout, and even the undercarriage retracting geometry are similar; in fact the only really obvious exterior improvement is the use of a one-piece, power operated "tear-drop" canopy. Contributing to the view is the extremely compact "package" power plant, designed by Fairchild around a 320 h.p. Lycoming radial engine driving a Hamilton Standard controllable-pitch airscrew. The cowling is commendably short, and a useful angle of vision is obtained from the front cockpit down over the nose.



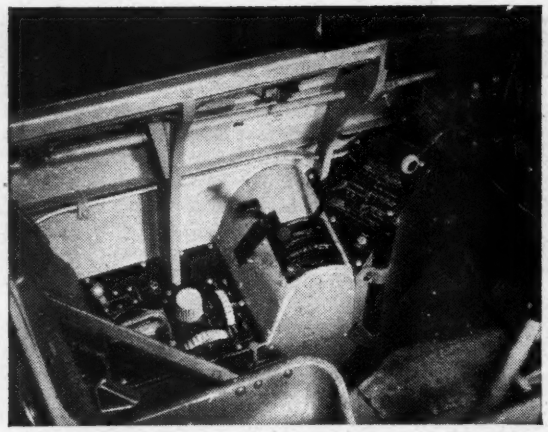
Flight instruments are outlined, as seen, by a white line. To the left and right are take-off and landing drill "check plates."

Functional Cockpit

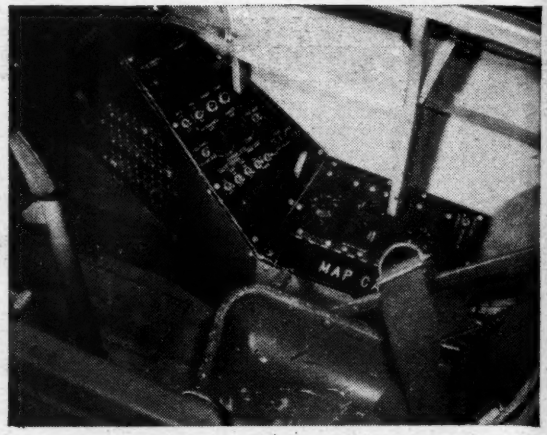
By far the most interesting ingredients of the XNQ-1 design are the incorporation of the standardized cockpits and recommended safety features, such as the one-piece canopy. Systems for rendering the pilot's job easier have been discussed many times over a period of years, but, so far as I know, the Navy cockpit is the first complete, practical system to be employed. Initial moves to clean up the cockpit were made in the United States in 1941, but research has been so fundamental and has covered so broad a field that the first fruits of the investigation have materialized only recently in the new cockpits of the XNQ-1, AD-1 Skyraider, F2M-1 Banshee, and so on.

Briefly, the basic principles of the new cockpit are: Standardization; simplification of controls—which are automatic where feasible—and instruments; natural placing of controls; grouping of controls for the same system or service; natural functioning of controls; ready identification of controls and simplification of instruction labels. How some of these principles work out in practice may be illustrated by more detailed reference to the Fairchild XNQ-1 cockpit.

Excellent examples of simplification are afforded by the canopy, which is operated electrically from a single "open-close" switch, and the flying controls locks, operated by a single lever in the cockpit. Indicator and warning lights are also used a good deal. Controls are placed so as to come easily to hand, and "sequence" controls are so arranged that they can all be operated by a single hand. For example, all controls included in take-off and landing drill are on the port side of the cockpit and are operated by the pilot's left hand. Secondary to this condition, controls are placed in as direct relation to the actual components as possible. The tail wheel lock is the rearmost control on the port cockpit board, where it not only forms a correct association of ideas in the pilot's mind due to



The port side of the cockpit, showing the "banked" control boards, the replica-wheel undercarriage lever (upper right), the aerofoil section of the flap lever grip (dead centre), and the trim controls, tail wheel lock, and fuel cock on the panel aft of the throttle quadrant.



The orderly disposition and neat installation of fuse, electrical and radio panels are evident in this view of the starboard side of the cockpit of the XNQ-1. The form of the control column grip is also apparent.

its backward position, but also comes readily to the left hand during cockpit drill. The aileron trim wheel is in advance of the tail surface trim wheels, which are side by side.

The main flight instruments are now grouped in the top centre of the dash, nearest the pilot's eyes. Radio, electrical, and (in other types) armament switches lend themselves to grouping on unit switch panels. Controls used for take-off and landing drill are confined to the port side of the cockpit and are grouped close to the pilot's left hand.

An outstanding example of "natural functioning" is the undercarriage control lever, which moves up for "wheels up" and down for "wheels down." Trim wheels move in the appropriate plane and indicators are adjacent to each wheel. The flap lever moves down for "flaps down" and also strikes an angle similar to that of the actual flaps. The undercarriage lever is shaped like a miniature wheel, and so may be identified by touch. Similarly, the flap lever has an aerofoil-section grip.

RUSSIAN CLAIM

THE world record for mileage flown is claimed by the Soviet Union for a Russian pilot, Nikolai Novikov, who will have flown about 1,864,000 miles on the completion of a flight on which he is at present engaged. B.O.A.C., however, state that this total has been exceeded by Capt. E. S. J. Alcock, brother of the late Sir John Alcock, the first pilot to fly the Atlantic non-stop in 1919, who has over 3,000,000 miles to his credit. At least three other pilots of the Corporation have also passed the 2,000,000-mile mark.

CROYDON FOR CHARTER ONLY

THE last scheduled air service from Croydon was the 4 p.m. plane for Guernsey on November 1st. Croydon was first opened for cross-Channel traffic on March 25th, 1920, and was in use continually as London's airport until the outbreak of war. The first scheduled flight when civil flying was resumed towards the end of the war was the re-opening of the Croydon to Liverpool and Belfast routes by Railway Air Services on November 13th, 1944.

The various Continental air lines which resumed operations to Croydon transferred their activities to Northolt, and B.E.A. routes to Manchester, Liverpool, Belfast and Guernsey were the only remaining services using Croydon. On October 6th B.E.A. transferred all except the Guernsey service to Northolt, and now that this is also stopped Croydon will in future only be used by charter companies and other non-scheduled services.

NORTHROP "JET WING"

A FEW facts concerning the experimental Northrop YB-49 eight-jet "flying wing" bomber, the first flight of which was depicted in *Flight* of October 30th, can now be given. The take-off run for this flight, during which the machine was flown by Max Stanley, was 1,170 yds. Never exceeding a speed of 200 m.p.h. the "Wing" climbed to 13,000 ft.

Empty, the YB-49 weighs only 88,100 lb and loaded, more than 200,000 lb. A crew of thirteen is carried, including pilot, co-pilot, navigator, radio operator, flight engineer, bomb aimer and gunner, with space for six off-duty crew members.

A special "electrically driven throttle," designed by Northrop, is said to keep the pilot from overthrottling the General Electric turbo-jets (4,000 lb static thrust each). The throttles open slowly and extend the life of the jet units by holding down tail-pipe temperatures.

It is understood that two prototypes of the YB-49 have been ordered by the U.S. Army Air Forces.

VICKERS' SHOWROOM

VICKERS, LTD., have re-opened their Vickers House showroom which was, of necessity, closed during the war. The premises have been renovated and re-stocked with models and in some cases with actual machines produced within the Vickers group. Activities of the firm in the aviation field are illustrated by models of the Viking as used by the King's Flight, the Viscount, the Attacker, Spiteful, Seafire, Sea Otter, Walrus and older types

Lt. Gen. Sir Ronald Weekes, Deputy Chairman of Vickers', who spoke at the opening of the new showroom, said that the transition from war to peace production had been carried through smoothly, and the firm could still compete successfully with the rest of the world in shipbuilding, engineering and aircraft construction.

FERRY AND DELIVERY FLIGHTS

MISS R. M. SHARPE, M.B.E., has joined W. S. Shackleton, Ltd., as demonstration and ferry pilot, and the firm now undertakes delivery of aircraft to any part of the world. Miss Sharpe was with A.T.A. from 1941 to 1945 and in that time delivered more than 60 different types of aircraft, ranging from Tiger Moths to four-engined bombers. While she was with the Air Movements Flight she carried upwards of 1,000 passengers and many tons of Red Cross supplies and other freight all over Europe without mishap. Needless to say, she is a fully qualified "B"-licence pilot.

FORTHCOMING EVENTS

Nov. 6th.—Royal Aeronautical Society: "Some Recent Developments in the Landing Gear Field." Capt. R. Lucien, A.F.R.Ae.S.

Nov. 8th.—British Interplanetary Society: "Electronics and Space Flight." Arthur C. Clarke.

Nov. 19th.—R.Ae.S. (Graduate and Student). "Aircraft Photography." John Yoxall.

Nov. 28th.—Royal Aeronautical Society: Joint Lecture with Inst. Mechanical Engineers. "The Development of the A.S. Type Gas Turbine." W. H. Lindsey, M.A., A.F.R.Ae.S. (Postponed Indefinitely.)

Nov. 29th.—Pathfinder Ball, Dorchester Hotel, Park Lane, London.

Dec. 4th.—Royal Aeronautical Society: "Problems Facing Civil Airline Operators." N. E. Rowe, C.B.E., B.Sc., D.I.C., F.R.Ae.S.

Dec. 6th.—Helicopter Association of Great Britain: "Some Aerodynamic Problems of the Helicopter." H. B. Squire.

Dec. 12th.—R.Ae.S. (Graduate and Student). "Aircraft Design from the Airline Point of View." Christopher Dykes, A.F.R.Ae.S.

Dec. 18th.—Royal Aeronautical Society: "The Work of the High-Speed Tunnel." Prof. A. Thorn, M.A., D.Sc., and W. G. A. Perring, F.R.Ae.S.

Jan. 7th.—British Interplanetary Society "The Man-Carrying Rocket." R. A. Smith.

HERE AND THERE

SWEDISH TRANSPORT: A particularly promising machine which has been flying for just twelve months is the SAAB Scandia 90A. It is a 24/32 seater which cruises at 224 m.p.h. but lands at only a little over 70 m.p.h. It has a nose-wheel undercarriage.

Variable Dihedral

ACCORDING to information just received from the Boeing Company the swept-back wings of its XB-47 Stratojet bomber are designed to droop slightly when the machine is on the ground. In flight they will rise to a level higher than the horizontal, "accounting for the greatest wing flexibility ever designed into an aircraft of this size."

Prentices Coming Through

MORE than a dozen Percival Prentice three-seat trainers have now been delivered to the R.A.F., and it is likely that the first ones will appear in service at Hullavington. A substantial contract for Prentices is in process of fulfilment at Blackburn's Brough works. Gipsy Queen 32s will power the first few machines but later batches will have the geared "52."

Jets in Quantity

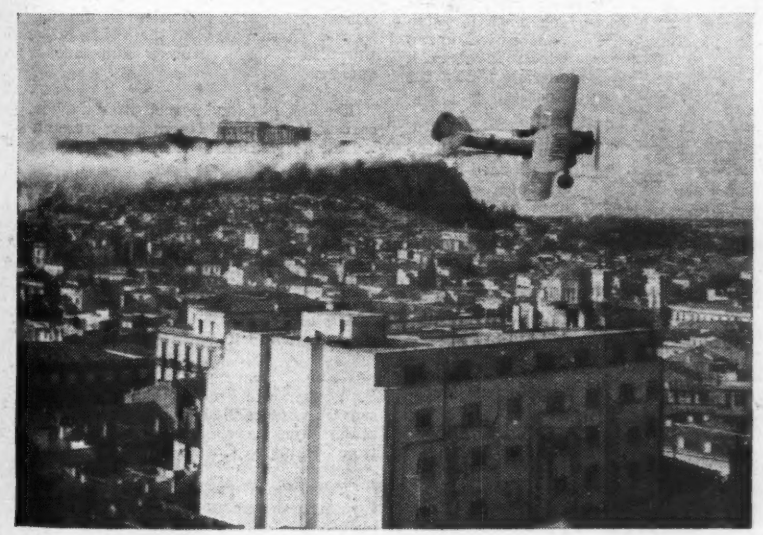
LAST year Lockheed delivered nearly four hundred P-80 Shooting Stars to the U.S.A.A.F. Deliveries of Republic P-84 Thunderjets during this period were few, but it has now been announced that a total of 550 of these new fighters is on order. Tests of the six "fifty calibre" guns in the Thunderjet have been made at speeds exceeding 600 m.p.h.

Exercise in Observation

THE whole of Southern England was covered by a Royal Observer Corps exercise last Sunday, arising out of that held on September 21st. These exercises have been concerned with correlating information on hostile aircraft, obtained by radar and the R.O.C., and making this available simultaneously at one point.

Exploratory Dove

MR. J. S. DUNKLEY, Mr. Peter Wynn and Mr. O. E. C. Carter have completed a 4,000-mile trip from the mouth to the source of the River Niger. They used a Dove, which landed on airfields not previously used by British aircraft. On one of these the "runway" is reported to have been covered in four-foot grass. The object of the flight was to check maps, record new tributaries and prospect bridge sites.



AIR MEASURES AGAINST CHOLERA: A Stearman belonging to U.N.R.R.A. spraying D.D.T. over Athens as a precaution. Some 80 square miles of the Cairo area had already been done and the medical department of K.L.M. flew 4,000 c.c. of vaccine into the Egyptian capital.

Low-flying Reports . . . .

A BRANCH of the Air Ministry has the task of investigating all low-flying complaints and deciding whether there have been breaches of flying discipline which justify action against the pilot. Of the reports received, 80 per cent are traced back to the individual aircraft concerned. About 20 per cent of the aircraft are not R.A.F. machines, and in many cases it is found that a Service pilot was merely carrying out legitimate training, or operating from an airfield so situated that low flying over buildings was unavoidable. Only a comparatively small number of the complaints are found to represent dangerous flying which inevitably calls for severe disciplinary action against the pilot.

. . . . and Investigations

INVESTIGATIONS of low-flying reports are made by the Flying Discipline section of the Provost Marshal's Branch. In charge of this section is a Squadron Leader who served 20 years in the Metropolitan Police C.I.D. His assistant is a Flight Lieutenant. These officers each travel an average of 2,000 miles a month on their investigations. In 1945 no fewer than 1,057 complaints were investigated, but the following year the number dropped to 248. So far this year, 317 complaints have been examined.

U.K. Delegation

ON November 3rd, a special commission of I.C.A.O. began a series of meetings at Geneva with the object of considering the exchange of commercial rights for international air transport services. This subject was discussed at Montreal during the first assembly of I.C.A.O., when it was then decided to refer it to a special commission.

The United Kingdom delegation is headed by Mr. W. C. G. Cribbett, C.M.G., Deputy Secretary of the Ministry of Civil Aviation, and includes Sir Frederick Tymms, K.C.I.E., M.C., and Major J. R. McCrindle, O.B.E., M.C.

B.C.P.A.'s New Manager

MR. A. A. BARLOW, erstwhile Group Captain in the R.A.A.F., has been appointed manager of British Commonwealth Pacific Airlines, with headquarters in Sydney. Previous to this appointment he was Assistant Flight Superintendent of Australian National Airways, with which he has been asso-

HERE AND THERE

ciated since 1936, and has to his credit some 7,500 flying hours and 18 years' flying experience.

Light Types, Heavy Duty

LIGHT aircraft are being used by New Zealand Government departments for a variety of purposes which include emergency flights to drop medical and other supplies and to evacuate sick or injured; patrol work; reconnaissance and photography; and surface sowing. Among the aircraft used are a Miles Whitney Straight, a Gemini, an Aerovan and an Expediter.

ATHODYD AIRBORNE: The Leduc 01 research aircraft, propelled by an athodyd, or ram jet, was lately launched for the first time from its "parent" Languedoc. M. Gounord, the pilot, is seen leaving the submarine-like fuselage.

Business Visitors' Club

AIMING to help the export drive by giving overseas visitors to this country every facility for conducting their business International Business Services, Ltd., of 14, Arlington Street, London, have announced the abolition of membership fees for the use of the I.B.S. club and information services. The premises in Arlington Street may now be used free of charge by overseas business visitors.

DOWN WITH THE LARK: Capt. A. G. Lamplugh ("Lamps" to his friends) of British Aviation Insurance Co. Ltd., arrives at his Lime St. office by Irvin-Bell helicopter in the small hours of Tuesday, Oct. 28th. Jimmy Youell was the pilot.

Locating the Locusts

SOUNDING like a squadron of bombers as they fly in swarms 20ft to 800ft deep, is how an Argentine gentleman has described the locusts which menace more than 50 per cent of the Argentine crops for at least seven months in the year. Nine Bell helicopters have been brought into the attack and are recording a 98 per cent kill of the insects by dusting them with di-nitro-ortho-crisol. The Argentine Air Ministry have been co-operating with the Ministry of Agriculture in the war against the crop destroyers, and two helicopters alone recently dropped 44,000 lb of dust in four days in the Paran region.

Freighter Feat

IN Ecuador, a single piece of drilling machinery weighing 9,963 lb was recently flown in a Bristol Freighter belonging to Airwork, Ltd. It is believed that this is the heaviest piece of machinery ever to be carried in this type of aircraft.

News in Brief

A SANDRINGHAM Mark VI flying-boat has been ordered by D.N.L. for delivery next spring, and for use on the routes to Northern Norway.

* * *

A kangaroo flown by Australian National Airways to Canada recently was provided with an oxygen mask for high altitude flying on the Vancouver-Toronto stage of the flight, which involves a crossing of the Rockies.

* * *

More than a million air miles have been logged by aircraft of K.L.M. airlines operating on the South American route since the Dutch service to Rio de Janiero and Montevideo was inaugurated on October 18th, 1946.

* * *

The American Society of Mechanical Engineers will hold its annual meeting in Atlantic City, U.S.A., at the Chalfonte-Haddon Hall Hotel, December 1st-5th next. There will be British participation, and an exhibition will form part of the programme. Material and equipment will be shown reflecting recent engineering and scientific developments, particularly in the fields of jet propulsion, gas turbines and nuclear energy.

* * *

The first gift food parcels from Canada, carried in a T.C.A. North Star, were unloaded at Heathrow recently.

* * *

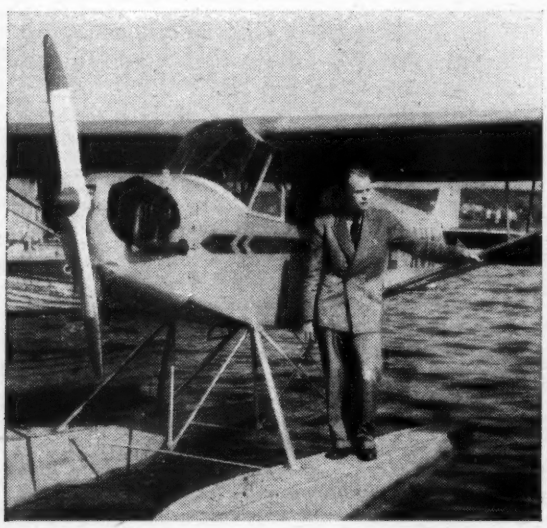
Count von Rosen was recently awarded the Royal Swedish Aero Club's Gold Medal with Wings for the "small plane record" he set up by flying a Saab-Safir from Stockholm to Addis Ababa, a distance of 3,856 miles, in 30 hours 52 mins.

* * *

A steady increase in the volume of air freight and in passenger traffic is reported by the K.L.M. West Indies Division. During the week ending September 6th, more than 2,000 passengers were carried, and 9 tons of foodstuffs alone have been flown each week from Miami to Curacao.

* * *

In response to the appeal by the Egyptian Government during the recent outbreak of cholera in Cairo, the Medical Dept. of K.L.M. Royal Dutch Airlines flew 4,000 c.c. of vaccine (sufficient to inoculate 40,000 people) from Rome to Cairo.



SPEEDY SWEDISH SALES: Mr. Alf Matsson, a Dunlop official of Norrköping, uses his Piper Cub floatplane on sales trips and finds that the saving in time is well worth the slight additional cost.

PRIVATE FLYING

Reports of Whitney Straight and Masefield Committees Published : Strong Recommendations for Government Support

READERS will remember the appointment, in January of this year, of an advisory committee under the chairmanship of Mr. Whitney Straight, "to advise the Minister of Civil Aviation on the development of private flying (including gliding) and to report to him from time to time on questions relating thereto." The Whitney Straight Special Advisory Committee on Private Flying has now issued its Preliminary Report, which is published by H.M. Stationery Office, price 1s 3d.

In the chairman's letter accompanying the report it is stated that the Committee held 17 formal and innumerable informal meetings. It had oral evidence from 50 witnesses and received a considerable volume of written evidence; the considered views of a number of associations and societies were received, and Dominion and foreign governments and national aircraft clubs had responded with interesting and useful information.

Main concern of the Whitney Straight Committee was the fate of the light plane clubs. It is pointed out that some 50 are now in existence, that the overall cost of operation is £4 per flying hour, and that the usual charge made is £3 per hour. The position is serious, and the Report states: "The Committee cannot overstress the necessity for prompt action if the flying clubs are to be saved." Consequently, it recommends that an agreement should be entered into between the clubs and the Ministry of Civil Aviation for payment of a subsidy on the basis of the amount of flying done, coupled with a further grant in respect of licences issued or renewed. It is suggested as a basis that subsidies be paid at the rate of £2 per flying hour, and in addition bonuses of £30 for each "A" licence issued and £5 for each "A" licence renewed. Maximum charges by the clubs for subsidized flying to be £1 per hour.

Published with the Whitney Straight Report is the Report of Mr. Peter Masefield's Informal Light Aircraft Committee, with whose recommendations the Straight Committee expresses itself in complete agreement. It has also taken evidence from the Ultra Light Aircraft Association, whose aim is amateur construction of small aircraft not exceeding a maximum of 1,000lb all-up weight. The Whitney Straight Committee feels that this sort of flying should be encouraged, subject to certain safety conditions. It is pointed out that a distinction will have to be made between light aircraft already in existence, which have at some time held a permit to fly without airworthiness certificate, and those which are to be built in the future. The Committee suggests that the former should be granted permits to fly, with the following provisos:—

Flights not to extend beyond three miles of the coastline of the U.K., to be limited to "Visual Flight Rules," and not to be made over populous areas. Acrobatic flying to be prohibited, policy of third-party insurance to be in force, the carriage of passengers or goods of any kinds to be prohibited [presumably this means "for payment or reward."—ED.], and all other requirements of the Air Navigation Regulations to be met

THE SPECIAL ADVISORY COMMITTEE ON PRIVATE FLYING

Mr. Whitney Straight, C.B.E., M.C., D.F.C. (Chairman)

F/O H. Bowden, M.P.
G/C. D. de B. Clark, C.B.E.
Mrs. A. C. Douglas
Mr. R. E. Hardingham, O.B.E.
A. Cdre. A. V. Harvey, C.B.E., M.P.
Capt. A. G. Lamplugh, C.B.E.
S/L. E. Kinghorn, M.P.
Mr. G. J. Mahoney
Col. R. L. Preston, C.B.E.
Mr. F. E. N. St. Barbe.

Secretary, Mr. W. K. Andrews

In the case of light aircraft to be built in the future, the Whitney Straight Committee recommends that these should have a C. of A. Requirements need not be so severe as those applicable to large aircraft, and it is thought the Air Registration Board could well work out the precise concessions to be granted.

Under the terms of reference, gliding came within the scope of the Whitney Straight Committee, which recommends that grants should be made to gliding clubs as follows: On the issue of a "B" certificate, £10; on the issue of a "C" certificate, £20; and on the issue of a silver badge, £90. It is estimated that for a subvention of £490,000 over a period of five years, a total of 100 gliding clubs or centres could produce 20,000 pupils with glider training up to at least the "B" certificate standard.

The Whitney Straight Committee reports that it has been much impressed by evidence from the Society of Model Aeronautical Engineers and recommends that redundant airfields should be made available at no cost to the model aircraft clubs.

In due course, the Committee opines, there should be at each airfield suitable buildings, and plans are shown of one possible layout of such an air centre. The Committee is anxious that each air centre should serve as a social focal point for the activities of model-making, gliding and power flying, but appreciates that these three flying activities may be operationally incompatible.

The concluding sections of the Whitney Straight Report are given verbatim.

Administration

The effective operation of the plan we have proposed will require a considerable amount of centralized administration. The Committee have carefully considered how best this can be done, and have come to the conclusion that, as far as possible, the responsibility for day-to-day matters should be delegated to the Royal Aero Club.

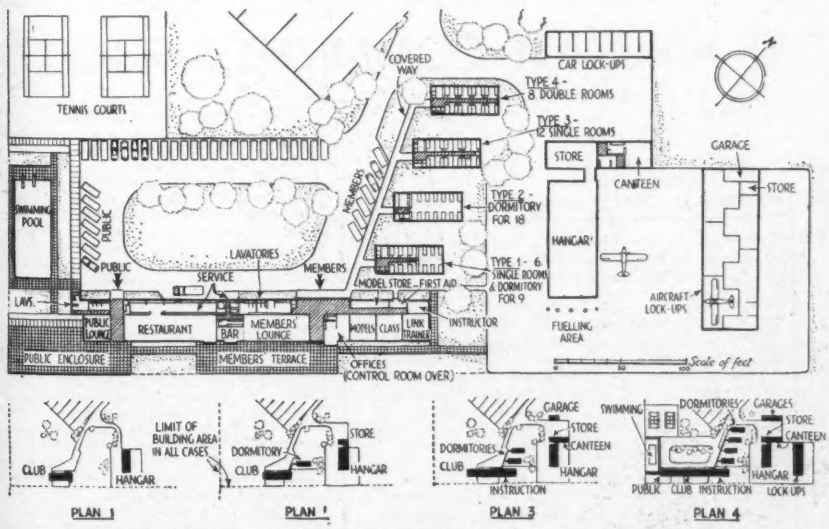
The Royal Aero Club, to which are affiliated the British Gliding Association, the Association of British Aero Clubs, and the Society of Model Aeronautical Engineers, possessing as it does excellent facilities at Londonderry House, is well equipped to do this work in an efficient and economical manner.

Repayment of expenses incurred in this connection should, of course, be made.

A further benefit to be derived from this recommendation is that an even closer working liaison will be built up between the Ministry of Civil Aviation and the Royal Aero Club, to the advantage of both.

Financial Summary

Light Aeroplane Clubs.—If 100 is taken as the upper limit of the number of light aeroplane clubs to be assisted in the five-year period of the initial agreement, and the maximum subsidy to any one club in any one year is £9,000, the maximum annual financial liability to the Treasury during that period will be £900,000. It is difficult to forecast the precise extent



Plans by Christopher Nicholson and Hugh Casson showing proposed layout of an air centre, with four stages in its expansion.

Private Flying . . . . .

to which subsidy will be earned annually on account of the uncertain factors involved; but the maximum will certainly not be reached in the early years.

Gliding.—The scheme outlined in Section VI of this report envisages an annual subsidy to gliding clubs of £49,000, rising to £147,000 in five years, at a total cost to the Exchequer of £490,000.

Equipment.—The estimated cost to the Exchequer in the provision of prototype aircraft as recommended in the report of the Informal Light Aeroplane Committee is £84,000, in addition to an interest-free loan of approximately £1,170,000 over two years to cover production.

Main Conclusions

(i) If we are to preserve our position in the world, Britain must now take the lead as an air-faring nation as she did in the past as a seafaring nation.

(ii) Just as a thriving shipbuilding industry is essential to a seafaring nation, so is a healthy aircraft industry essential to a nation of air-farers.

(iii) A vigorous national aviation movement (covering model-flying, gliding and powered flying) is of fundamental importance to the future well-being of the British aircraft industry.

(iv) If the country is to establish itself in a leading position in aviation, a start must be made with young people at school.

(v) It is virtually certain that, without State assistance, all but a very few of the light aeroplane clubs will be forced to close down in the near future.

(vi) Present club flying charges are beyond the means of all but a small section of the community.

(vii) Gliding is an integral part of aviation training and the proposed Air Centre organization.

(viii) Immediate financial assistance to gliding clubs is essential.

(ix) The model aeroplane movement is clearly of national importance.

(x) An adequate number of the right kind of aircraft is essential if a national aviation movement is to be fully effective.

(xi) A new approach must be made to the aerodrome problem.

Summary of Recommendations

(i) The respective activities of model-making, gliding and power flying, which form a natural chain in the progress of aviation training, should be co-ordinated on a national scale.

(ii) The closest collaboration should be maintained between the Ministry of Civil Aviation and recognised aeronautical bodies in presenting in attractive form matters designed to foster the air-faring spirit.

(iii) Subsidy rising to a maximum of £900,000 per annum after three years should be made available to approved flying clubs to enable flying charges to be reduced to £1 an hour.

(iv) An agreement should be concluded with approved flying clubs for a period of five years, with provision for review of the financial conditions after three years.

(v) A scheme should be designed to encourage the creation of new flying clubs to bring the number, with the existing clubs, up to one hundred so as to provide adequate coverage for the country as a whole.

(vi) Assistance amounting to a maximum of £490,000 spread over five years should be made to gliding clubs.

(vii) An agreement for a period of five years, with provision for a review of the financial provisions after three years, should be negotiated with the British Gliding Association.

(viii) A central civil gliding instructors' school should be established.

(ix) There should be the closest collaboration between the Ministry of Civil Aviation and the Ministry of Education with a view to introducing aero-modelling in the handicraft curriculum of all appropriate schools, and such activities should be co-ordinated with the facilities to be provided at air centres.

(x) Redundant aerodromes and other suitable and convenient open spaces should be made available for the flying of model aircraft at no cost.

(xi) As a contribution towards their overall cost, a grant should be made of £84,000 to cover prototypes of two-seater all-metal trainer-tourer light aeroplanes and of general purpose two-seater gliders, as recommended by the Informal Light Aircraft Committee, and there should also be an interest-free loan of approximately £1,000,000 to finance a production order of a thousand aircraft, and a further £170,000 for the production of two hundred gliders over two years.

(xii) Ultra-light aircraft should be required to possess a certificate of airworthiness, but such aircraft which have in the past been granted a permit to fly should be allowed to fly again subject to certain conditions and to inspection to ensure a sound state of maintenance.

(xiii) To encourage the development of ultra-light aircraft, every effort should be made to reduce the cost of securing a certificate of airworthiness for these aircraft.

(xiv) Attention should be directed towards the training of maintenance engineers.

(xv) Attention should be given to the research requirements of the light aircraft industry and appropriate financial grants made.

(xvi) Regulations affecting private flying and gliding should be kept to the absolute minimum compatible with safety.

(xvii) Existing regulations in relation to control zones should be reviewed in consultation with the Royal Aero Club, who should also be consulted before future regulations on the subject are promulgated.

(xviii) No medical examination or form of licence should be required by a student pilot prior to the stage at which he flies solo.

(xix) Every opportunity should be given to all interested parties to express their views before changes recommended by the International Civil Aviation Organization with regard to "A" pilots' licences and glider pilots' licences are acepted.

(xx) A further reduction in landing fees should be considered, and the scope of the season ticket landing card extended.

(xxi) A scale of housing fees should be standardized throughout the country.

(xxii) A study should be made with a view to finding a more efficient method of housing aircraft to economize in space.

(xxiii) An aerodrome for private flying and light charter work need in its most simple form consist only of two strips of, say, 600 yards by 75 yards.

(xxiv) A number of State aerodromes which have reverted to agricultural use could very well be made available for private flying and gliding without in any way detracting from their agricultural value.

(xxv) There should be some relaxation in connection with the use of existing Service aerodromes except perhaps those used for special purposes.

(xxvi) An immediate survey should be made and a definite plan decided upon in consultation between the Ministry of Civil Aviation, the Aerodrome Owners' Association, and the Royal Aero Club, to make available for private flying a network of one hundred aerodromes suitably distributed over the country.

(xxvii) At each aerodrome there should be constructed an Air Centre consisting of three sections—an operations section, a social section, and a sports section.

(xxvii) The construction and operation of Air Centres may best be undertaken by municipalities either directly or in collaboration with private enterprise.

(xxix) As far as possible responsibility for the day-to-day administration of schemes introduced as a result of the Committee's report should be delegated to the Royal Aero Club.

INFORMAL LIGHT AIRCRAFT COMMITTEE'S REPORT

THE Informal Light Aircraft Committee was set up under the aegis of the Ministry of Civil Aviation, with the co-operation of the Royal Aero Club, the Association of British Aero Clubs, and the British Gliding Association, in November, 1946, to explore requirements for a new generation of British light aeroplanes and gliders and to report on types likely to be needed for the home and export markets.

The Informal Committee has kept before it a basic requirement for providing means of getting the maximum number of persons into the air safely, cheaply and simply.

During the first eight months of its work 20 meetings have been held. The Committee remains in being. Chief observations and recommendations contained in the Informal Committee's first report are:—

The I.L.A.C., having reviewed types of light aeroplanes and gliders likely to be required for use in the United Kingdom and for exports, puts forward, as its primary recommendation, a specification for a basic type of two-seat all-metal trainer-tourer (I.L.A.C. Type 1).

The objective which the Committee has had pre-eminently in mind has been the attainment in one machine (which would be versatile enough for wide use for both training and touring and capable of being built in large numbers), of the optimum compromise in pursuit of the ideals of maximum safety, simplicity, low operating cost, moderate prime cost, and long life. It recommends that the specification of requirements for the proposed Basic Trainer-Tourer should form the subject of a design competition, and that two prototypes should be constructed from each of the three best designs submitted which are backed by companies capable of large-scale production and willing to produce in quantity at an acceptable price. It is further recommended that, after the completion of the six prototypes, a production order should be placed officially for the design selected as being the most satisfactory. So that the price may be economic, the Informal Committee recommends that not less than one thousand aircraft of the selected design should be laid down.

INFORMAL LIGHT AIRCRAFT COMMITTEE

Mr. Peter G. Masefield, M.A., F.R.Ae.S., Chairman
Mr. R. H. Walmsley, F.R.Ae.S., Vice-Chairman
W/Cdr. Brian Davey, Instructor

Mrs. Ann C. Douglas
Mr. E. R. G. Heath, M.A., M.B.E.
Mr. Thurstan James
Mr. Marcus Langley, F.R.Ae.S.
W/Cdr. C. J. Mahony
Mr. Arthur Marshall, M.A
Mr. G. H. M. Miles
Mr. C. H. Naylor, B.Sc.
Col. R. L. Preston, C.B.E
Mr. Guy Robson
Mr. W. S. Shackleton
Mr. S. Scott-Hall, M.Sc., F.R.Ae.S
Mr. E. Colston Shepherd, B.A.
W/Cdr. Maurice Smith, D.F.C
S/Ldr. E. H. Spence
Mr. Whitney Straight, C.B.E., M.C., D.F.C.
Mr. H. A. Taylor
Mr. Walter Tye, B.Sc., F.R.Ae.S.
Mr. A. F. Woodward-Nutt, B.A., F.R.Ae.S.
Mr. B. Vaughan Williams, M.C.

Secretary: Mr. L. Tibby

Private Flying . . . . .

all to be delivered within two years of the first flight of the first production machine.

The Committee also believes, with the British Gliding Association, that the most urgent need of British gliding is a general-purpose two-seater of medium-high performance. It therefore recommends that two prototypes should be built to each of the three best designs chosen from the results of the competition for a two-seater, held recently by the British Gliding Association, thus utilizing the large amount of work already done. A bulk production order should then be placed, officially, for not less than two hundred gliders to the design judged to be most satisfactory after the prototype trials.

The I.L.A.C. feels bound to emphasize that, in its opinion, these recommendations, for a basic trainer-tourer and a two-seater glider, can only achieve their purpose of making possible widespread flying in the British Isles and of creating a healthy export market, if a national scheme for financial assistance is instituted to establish light aircraft flying and gliding in the United Kingdom on a broad scale. Such a national plan, to succeed, would have to reduce flying charges to the public to not more than £1 per flying hour. The Committee is of the opinion that, under present conditions, the only effective method of creating a new generation of British light aircraft is by means of a Government grant to pay for the building of prototypes and by means of an interest-free loan from the Government to cover and underwrite the quantity production of the types recommended. Such a loan should be recoverable against sales, leaving only the cost of prototypes outstanding.

A target for the present-day cost of a light aircraft of the basic type recommended, produced in a quantity of not less than 1,000, should be approximately fifteen shillings per pound of loaded weight, or a total of about £1,000 per aircraft. This presupposes an engine of low cost, produced in quantity.

Recommendations by the I.L.A.C. concerning the cost of founding the equipment side of a National Flying Movement are that the six prototypes of the three selected designs of the basic trainer-tourer should be paid for (preferably through the Royal Aero Club) from a national grant of £60,000 towards their overall cost. Similarly, the six prototypes of the three selected designs of two-seat glider should be paid for by a further grant of £24,000 towards their overall cost. After prototype trials, the Government should make available the sum of £1,000,000 to finance the production order of 1,000 aircraft and a further £170,000 for the production of 200 gliders. This total sum of £1,170,000 would be used in the form of progress payments and/or underwriting of orders, so that work could be instituted without delays. A timetable is suggested by the I.L.A.C. as follows:—

(i) Design competition authorized. September, 1947.

(ii) Design tenders to be submitted. January 15th, 1948.

(iii) Selection of three best design capable of being produced in quantity. March 1st, 1948.

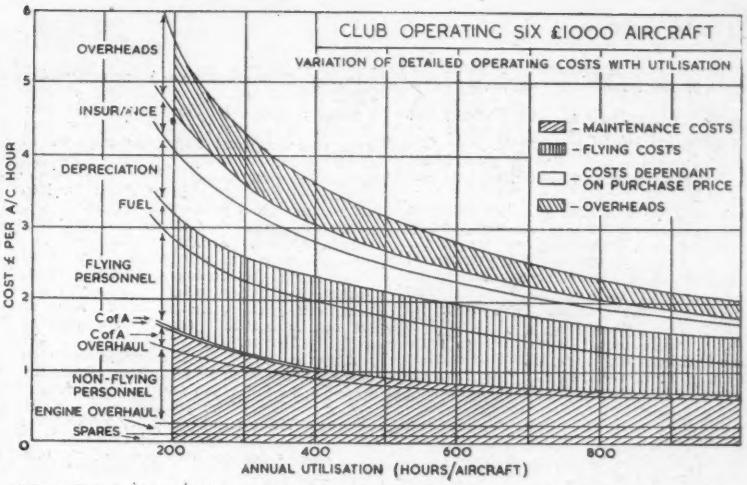
(iv) Prototypes flying and under test. January to May, 1948.

(v) Best prototype selected, modification. June, 1948.

(vi) First production aircraft flying. June, 1950.

Costs

The Informal Committee is convinced that an essential of any new type of British light aircraft must be an inherent and substantial improvement in the cost of operation. The Committee has come to a realization that the chief factor in reducing operating costs must be an improvement in maintenance characteristics over existing standards. Present-day maintenance items account for about 30 per cent of the total operating costs of existing aircraft. The



Informal Committee believes that by careful design these costs can be materially lowered.

The pre-eminent need for such an aircraft becomes evident from an examination of the situation of light aircraft flying in the United Kingdom to-day. Clubs are charging between £3 10s and £4 per flying hour and losing money on it.

Detailed examination of costs to clubs and flying schools has revealed a fairly wide divergence. But it appears that they can be broadly divided as follows:—

	Per cent
Maintenance (labour and materials)	31
Flying personnel (instructors)	22
Fuel and oil	18
Depreciation and insurance	16
Overheads	13

A figure for rent of airdromes, hangars and buildings has not been included because of the very wide variation of these amounts.

Primary points which stand out, in addition to the maintenance aspects, are:—

(i) A relatively wide variation in first cost has a relatively small influence on operating costs per hour over a five-year life.

(ii) The cheapest possible form of two-seater, judged on first cost, does not show up well in overall operating cost against a type which costs more initially but has designed into it improved maintenance characteristics, impossible in the cheapest type.

(iii) Costs per hour decline substantially up to a utilization of at least 750 hours per aircraft per year.

(iv) Costs per hour declined substantially for an increase in the number of aircraft operated up to at least 10 per fleet.

(v) The annual cost to a private owner of even the cheapest form of light aircraft will, inevitably, place true private ownership beyond the means of any but a very few people. The value of the light aircraft for business journeys should, however, bring about an increase in this form of private ownership.

Examination of production costs has suggested that the cheapest form of light two-seater could be built for not less than about £800, whereas, built in quantity, the proposed I.L.A.C., Type I Basic Trainer-Tourer should not cost more than £1,000. Whereas a utilization of more than 500 hours per year would be unlikely to be achieved with the cruder machine, a utilization of 750 hours per aircraft per year should be well within the capabilities of the Type I.

Estimated costs of flying to the private owner work out as follows for the I.L.A.C. Type I—

	Utilization 100 hrs p.a.	Utilization 200 hrs p.a.
	£ s d	£ s d
Cost per hour	6 2 6	3 11 7
Overall cost per year	627 0 0	717 0 0

Cost conclusions reached by the Committee are therefore:—

(i) The proposed all-metal I.L.A.C. Trainer-Tourer is likely to prove substantially cheaper over a period of time than any other type of comparable light aircraft.

(ii) Under present conditions (1947) efficiently run schools and clubs are likely to have to charge somewhat more than £3 per flying hour, and some form of financial assistance on a national scale is therefore essential.

(iii) There can be little future for the private owner who flies for pleasure only, because of the expense.

(iv) The most practical way to establish a flourishing light aircraft movement in the United Kingdom is through the development of efficient flying clubs combined with "Hire-and-Fly-Yourself" schemes, equipped with adequate numbers of aircraft.

Gliding Costs

Gliding clubs would be able to operate the proposed two-seat glider at a cost of about £1 15s per hour without profit, at a rate of 400 hours per year for a fleet of six gliders. The hourly charge to members would have to be about £2. In addition to the most generous Kemsley Plan some national scheme is clearly required to bring the charges economically within the reach of the "man in the street."

Future Programme

Regarding research and development, the Informal Committee recommends that attention be given to—

(i) Simplified controls and flying characteristics.

(ii) Improved undercarriage characteristics for cross-wind landing.

(iii) Improved forms of construction and production.

(iv) Low-cost radio aids.

(v) Reduction of noise and vibration.

(vi) A "Roadable" aircraft.

(vii) A cheap, easy-to-fly, helicopter.

(viii) Improved power plants.

Reasons for Basic Type Recommendations

Five fundamental reasons lie behind the selection of the I.L.A.C. Type I for primary attention: (i) The shortage of any modern standard trainer; hence the need for an aircraft which will set standards of safety and ease of maintenace on which a new era of light aircraft flying can be founded. (ii) The desirability of standardizing one type suitable for basic training, club use, "Hire-and-Fly-Yourself," and for export, thereby spreading overhead costs over the largest number of aircraft. (iii) The need for a type of aircraft which, in standardized form, can lead, both in manufacture and in training to later types of higher capacity and performance. (iv) The need for the cheapest possible aircraft which will combine characteristics of low operating cost, wide appeal, safety and simplicity. (v) The fact that engines of the appropriate power and cost

Private Flying . . . . .

are likely to be more readily available for such a two-seater than for any other class.

Specification for Basic Two-seat Training-tourer (I.L.A.C. Type 1)

A single-engine light aircraft suitable for primary instruction and air touring at home and abroad.

General.—(a) The basic principle observed in the preparation of this outline specification has been a desire to give designers the greatest possible freedom for expression of their own ideas. Only those points which are considered to comprise essential and fundamental requirements have been included.

(b) A really robust machine is of paramount importance. Long life of units must be aimed at in the design. Ease of maintenance with minimum cost should be a primary consideration. This aircraft should show a substantial advance in four respects:—

(i) Safety and simplicity of handling in the air and on the ground.
(ii) Reduction of inspection, maintenance and overhaul costs.
(iii) Ease of entry and exit and reasonable comfort.
(iv) Adaptability for operation in extremes of climate.

(c) Any reasonable compromise in the specification as now set out will be considered if it has as its result the introduction of an appreciable improvement of robustness of construction, economy of servicing, safety or comfort.

(d) The selected aircraft will be required to undergo intensive trials between the prototype and production stages.

Power Plant.—Engine to be adequate to achieve the required performance. Starter and generator are required as standard fittings. The aim should be 750 hours between overhauls. It is hoped that the engine required will not cost more than £150, for quantity production.

Layout.—Two-seat enclosed side-by-side, two-door aircraft, with emphasis on good view. Particular attention should be paid to ease of entering and leaving the aircraft. This should be possible without treading on the seats.

Controls.—(i) Full dual controls to be provided, with the right controls easily removable. Preference will be given to a two-control system, eliminating the rudder-bar. If a two-control system is provided, provision should be made also for installation of a conventional three-control arrangement to special order.

(ii) Hydraulic or pneumatic services for the operation of controls will not be accepted. Manually operated controls are to be provided.

Flying Characteristics.—A non-spinnable aircraft with exemplary stalling characteristics is required. However, the designer should bear in mind that a spinnable version with three controls might be required to special order.

Accommodation

Seats.—Width of cabin at elbow level to be not less than 50 inches. Alternatively, a narrower cabin would be accepted if a convenient and practical method of staggered seating can be arranged without jeopardizing the dual-control arrangement. Particular attention to be given to adequate headroom, seat dimensions, and angles as set out in F.P.R.C. 682, with a view to avoiding fatigue.

Baggage Space. — Reasonable stowage space for up to 80lb of baggage within c.g. limits, with full tanks and full load. Stowage space should be available for a lightweight V.H.F., two-way radio, for which a weight of 30lb should be allowed.

Towing.—Provision to be made for a towing attachment for use as a light glider-tug.

Noise.—The noise level in the cabin should be such that conversation should be possible without raising the voice, and cabin should be free from drumming or other objectionable noise.

Shipping.—Wings should be quickly detachable at the sides of the fuselage. Aircraft should be easy to dismantle for shipping.

Cabin.—The cabin must be weatherproof, draughtproof, well ventilated and free from vibration. Consideration will be given to designs in which provision is made for an occasional third seat in substitution for baggage capacity, but it is not desired to sacrifice the prime requirements of the two-seater for the less urgent demands of the three-seater.

Visibility.—A good all-round view while taxying, taking-off, flying horizontally, and circling an airport, is considered a prime requirement.

Instruments.—Provision to be made for a full blind-flying panel to be fitted on special order. (Full blind-flying panel will be required in prototype aircraft.)

Undercarriage.—Fixed, faired, tricycle undercarriage, with steerable nosewheel. Emphasis should be placed on nosewheel of adequate diameter, with complete absence of shimmy. A guard or deflector to be provided to prevent damage to the airscrew through mud, stones, etc., thrown up by nosewheel. The track of the undercarriage to be not less than 25 per cent of the span.

Two-wheel brakes to be fitted. Heel-operated brakes are not acceptable. No hydraulic or pneumatic services should be installed.

The compression struts are to be of the simplest form. Oleo pneumatic systems calling for expensive and elaborate ground equipment are not acceptable. Treaded tyres are required.

Performance

The following requirements under standard conditions must be met:—

Stalling Speed.—Not more than 55 m.p.h. with full load, engine off.

Take-off.—Height of 25 feet to be gained in not more than 300 yards from rest on grass in a 5 m.p.h. wind at sea level. A height of 50 feet to be gained in not more than 400 yards in the same conditions. Minimum initial rate of climb with full load not to be less than 600ft per minute at sea level with a gradient climb of 3½ per cent.

Landing Run.—To be within the above take-off figures. Aircraft required to come to rest over the same heights within the same distances using brakes.

Cruising Speed.—Not less than 110 m.p.h. true air speed at 1,000ft under no more than 70 per cent power.

Duration.—Tanks to be provided for not less than five hours' duration at the above cruising speed and power, including take-off and climb to 1,000 feet. This duration to be attained with a payload of not less than 420lb (two persons at 180lb each plus a total of 60lb of baggage). Stowage must be provided within c.g. limits, with full or empty tanks without recourse to the carriage of ballast.

Servicing and cost requirements are also laid down.

Summarized Costs for Private Owners

Estimates for I.L.A.C. Type I, and assumed to cost £1,000.

Annual Fixed Costs.—(For five years' service life).

	£
Depreciation (10 per cent residual value after five years)	180
Insurance	100
C. of A. Overhauls	122
C. of A. Fees	5
Landing Fees (Two Landing Cards)	10
Hangarage	70
Sundries	50
Annual Fixed Costs—Total (not varying with number of hours flown)	£537

(*Continued on page 525*)

FLYING CLUB OPERATING COSTS

No. of Fleet and Individual Value	Total for Three Aircraft £1,000 Value		
Utilisation	**200 hr**	**500 hr**	**1,000 hr**
	£ s. d.	£ s. d.	£ s. d.
Depreciation (av. over 5 yr allowing 10 per cent purchase price as residual value after 5 years' use)	540 0 0	540 0 0	540 0 0
Insurance (10 per cent purchase price. No allowance for 1st part any claim)	300 0 0	300 0 0	300 0 0
Licensing. (C of A fees) ...	15 0 0	15 0 0	15 0 0
Hangarage (£80 per a/c p.a.) ...	240 0 0	240 0 0	240 0 0
Club premises (rent and rates) ...	175 0 0	175 0 0	175 0 0
Repairs to buildings, roads, etc. ...	20 0 0	20 0 0	20 0 0
Office furniture and equipment (depreciation)	25 0 0	25 0 0	25 0 0
Office heat and light	40 0 0	40 0 0	40 0 0
Office Insurance (fire and fidelity, etc.)	10 0 0	10 0 0	10 0 0
Office telephones and postage ...	60 0 0	75 0 0	90 0 0
Office stationery	60 0 0	75 0 0	90 0 0
Advertising (weekly "Smalls" in "Flight" and "The Aeroplane")	100 0 0	100 0 0	100 0 0
Fire-fighting equipment	25 0 0	25 0 0	25 0 0
Sundries (local transport and various)	100 0 0	125 0 0	150 0 0
Chief Instructor/Secretary	500 0 0	900 0 0	900 0 0
1st Assistant Instructor	—	700 0 0	700 0 0
2nd Assistant Instructor	—	—	650 0 0
Insurance (Instructors' P.A. £2,000 cover)	65 0 0	130 0 0	195 0 0
Timekeeper/Storekeeper	300 0 0	300 0 0	300 0 0
A.B.A.C. Subscription	20 0 0	20 0 0	20 0 0
Senior Licensed Engineer	500 0 0	500 0 0	500 0 0
Junior Licensed Engineer	—	400 0 0	400 0 0
Unlicensed Mechanic/Cleaner ...	156 0 0	—	156 0 0
Insurance (National Health for Ground Staff)	62 0 0	62 0 0	183 0 0
Workmen's Compensation (pilots)	23 0 0	40 0 0	56 0 0
Workmen's Compensation (Ground staff)	4 0 0	6 0 0	7 0 0
Aircraft Spares (general)	60 0 0	75 0 0	105 0 0
Aircraft Spares and materials (for C of A)	150 0 0	175 0 0	200 0 0
Cleaning materials	20 0 0	35 0 0	45 0 0
Operating costs for three aircraft...	3,970 0 0	5,108 0 0	6,237 0 0
Operating costs for one aircraft ...	1,323 6 4	1,702 13 4	2,079 0 0
Cost per hour per aircraft ...	6 12 5	3 8 7	2 1 7
Add Cost of Petrol and Oil at 7s per hour	7 0	7 0	7 0
Add cost of engine complete overhaul per hr (£75 per 550 hr) ...	3 0	3 0	3 0
Total cost per flying hour (*no profit*)	7 2 5	3 18 7	2 11 7

Seen from a Hythe are the Johore Straits, between Singapore and the State of Johore.

LOOKING TO THE EAST

Airports and Alighting Bases on the Empire Routes to Singapore

PICK at random any of the stopping places on the Empire routes to the East. Consider its position and study its importance in relation to the main trunk route and to the surrounding country. Consider also the nature of its immediate surroundings and the extent of natural facilities available. Then it can be realized how each of these very important staging posts has its own peculiar problem.

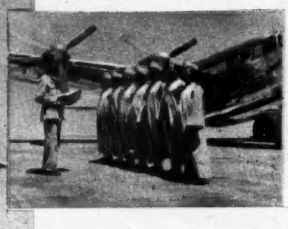
Many of the countries through which the Empire routes pass are enterprising and have an interest in aviation; others, on the other hand, have no prospect of organizing their own airports, nor have they the facilities and money with which to compete with their more advanced neighbours. The responsibility for providing amenities and facilities at airports and along the Empire routes must, therefore, fall upon the operating airlines, and, since the British Overseas Airways Corporation operates with aircraft having a shorter range than its American competitors, the intermediate stops are more frequent; moreover, the Corporation is looked upon to provide, in many cases, local one-stage hops of several hundred miles along the trunk routes.

Natural alighting places for flying boats have been found and developed, but landplane airports are a different problem and an expensive luxury to those countries with no aviation interests. It is consequently all the more surprising to find at many of the obscure airports modern, permanent buildings constructed to provide airline passengers with food and comforts during short halts; officials for Customs and Immigration, in addition to traffic handling facilities; and even transport to the nearest town, where overnight stops are involved. At Basra, for example, on one side of the elegant passenger-handling building is the landplane airfield; on the other side, the airport building overlooks the Shatt-el-Arab at the confluence of the Rivers Tigris and Euphrates, where the flying boats alight. As a contrast, passenger reception is in marquees and other temporary structures, while at Calcutta the flying boat reception offices are on a house-boat on the River Hoogli.

The control of aircraft in the air and on the ground is another problem which must often be solved by the Corporation. Flight supervisors, who will fill posts at airfields in the U.K. and along the Empire routes, are being trained in all aspects of flying control, for commanders of aircraft must be kept fully informed of prevailing weather conditions and of any airfield diversions. For this purpose many ex-pilots of the Corporation and ex-flying control officers of the R.A.F. have been engaged, and for the control of aircraft at airports, B.O.A.C. have undertaken to recruit and train controllers on behalf of the Ministry of Civil Aviation.

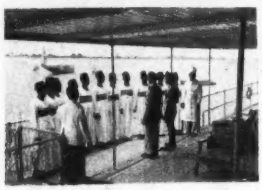
The routes to the East are flown by the Corporation with Yorks to Karachi and Calcutta, and between Colombo and Singapore; with Hythe flying boats to Bahrein, Karachi and Singapore, and from there onwards to Sydney. Plymouth flying boats fly to Hong Kong and between Singapore and Hong Kong; Lancastrians fly right through to Sydney, and Haltons as far as Cairo.

The B.O.A.C. windsock (upper left) aids flying boats using Augusta Harbour, Sicily. The main building at Augusta is shown here.

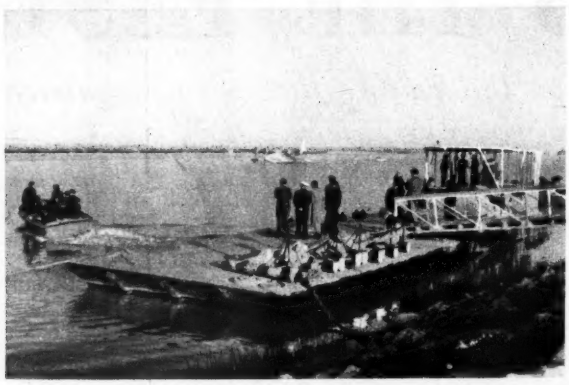


Sudanese security wardens, one of whom is seen on the right, parade at Almaza to receive instructions.

LOOKING TO THE EAST . . . .



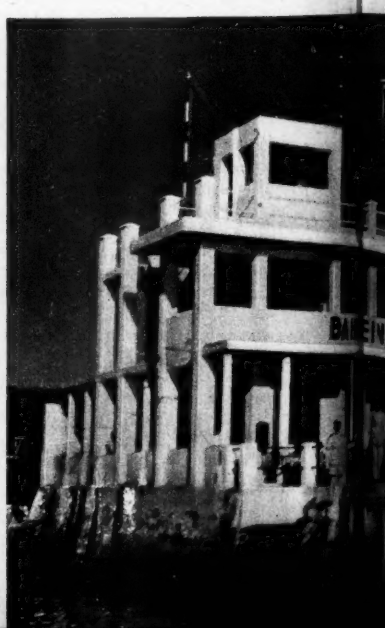
The strong sunlight at Almaza Airport, Cairo, accentuates the lines of the administration buildings. With one of the Corporation's flying boats at anchor in the background, members of B.O.A.C.'s Cairo staff are seen addressing Egyptian employees.



The scene above shows activity on the B.O.A.C. jetty at the Port of Basra upon the arrival of a Hythe. The splendid building below is the Airways Terminal at Basra, which backs on to the river seen above. This is a Persian Government building.

The B.O.A.C. Speedbird route between Poole and Singapore traverses some of the most romantic countries of the world.

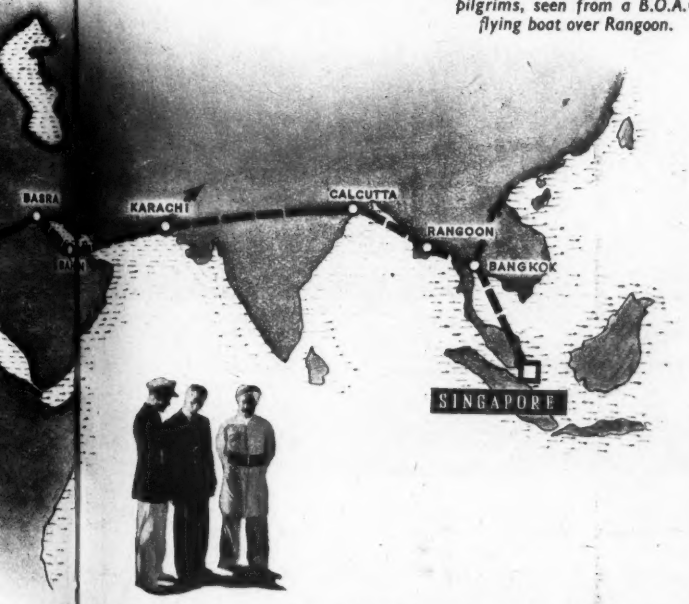
Below are reception offices at Bah



The Shwe Dagon Pagoda, one of the greatest shrines of Buddhist pilgrims, seen from a B.O.A.C. flying boat over Rangoon.

A B.O.A.C. reception houseboat by the Willingdon Bridge at Calcutta. (below)

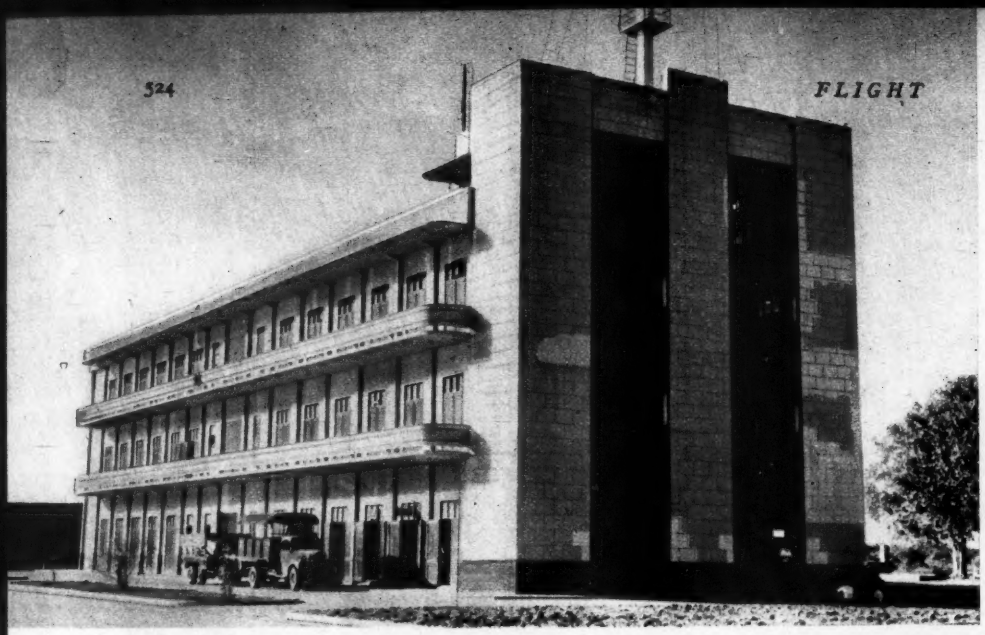
(above) An R.A.F.-type wireless tender serves as a signals room at Rangoon.



Reception building at Korangi.

ffices at Bah on the Persian Gulf. Some of the catering staff at Korangi (above).

A Hythe is seen below in B.O.A.C.'s floating dock at Korangi, near Karachi. This is the only one of its kind on the route.



Bold design characterises the B.O.A.C. reception building at Bangkok (left). A Siamese official of the Corporation is seen above in working dress.

LOOKING TO THE EAST . . .

Daun Muang (or Don Muang), location of the airport building seen on the left, is about 15 miles from Bangkok. Above is a Hythe leaving the Menam at Bangkok.

The Speedbird Lancastrian "Newcastle" (left) is receiving attention at the Singapore (Kallang) landplane base.

An engineer's conference (below) beneath the nose of the same Lancastrian.

MILES AIRCRAFT STATEMENT

RECENT statements have indicated that Miles Aircraft, Ltd., is faced with financial difficulties. Mr. S. R. Hogg, F.C.A., who was appointed manager on September 27th, has now sent a letter to creditors of the company in which he explains the position.

The letter points out that during 1947 the company went into preliminary production of the Messenger, the Aerovan and the Gemini, the former being built by a subsidiary company, Miles Aircraft (Northern Ireland), Ltd. Substantial production of the Gemini and Aerovan did not take place until 1947, and the Marathon production has only now started. The Merchantman has not yet come into production.

Cost of production has been in excess of estimates, partly due to the crisis of February and March, and the civil aircraft sold this year have involved the company in considerable loss.

Mr. Hogg states that he is now negotiating in many directions to re-establish the company's trading on a satisfactory basis, but that these negotiations must be of a confidential nature. He has consulted four of the principal trade creditors: Blackburn Aircraft, Ltd.; De La Rue Extrusions, Ltd.; Smiths Aircraft Instruments, Ltd.; and the Sperry Gyroscope Co., Ltd., and has given them a confidential report.

In order to avoid unfairness, Mr. Hogg has stopped, for the time being, payments for supplies or services rendered before September 26th, but where goods have been supplied since that date, at his express request, payment will be made immediately. It is also hoped to make payment in the near future for other goods supplied since that date.

Creditors are asked to leave the position in Mr. Hogg's hands until they receive from him a comprehensive report; this he expects to be able to issue in about a month's time. Mr. Hogg is hopeful that present negotiations will be brought to a satisfactory conclusion, and that the further loss which would inevitably result from a liquidation may thus be avoided.

AT THE RECEPTION: Discussing the Safir with Mr. Roland Johnson (left), Sales Manager of the Swedish company, SAAB, are (l. to r.) W/C. Maurice Smith, of Flight; Mr. Alex Duncan and S/L. M. D. Creighton, aviation managers of R. K. Dundas Ltd.; Mr. Michael Christie, director of Christie-Tyler Ltd.

SWEDISH VISITOR WELCOMED

A VERY pleasant and somewhat unusual party was given at the R.Ae.C. Air Centre, Londonderry House, on the evening of Friday, October 31st, in honour of Mr. Roland Johnson, sales manager of the Svenska Aeroplan Aktiebolaget (SAAB) of Linkoping, Sweden. The hosts were R. K. Dundas, Ltd. in association with Christie-Tyler, Ltd. Lord Ronaldshay, chairman of R. K. Dundas, Ltd., who are SAAB's representatives in this country and in the Commonwealth, welcomed Mr. Johnson and spoke of the aircraft and automobile designs of the Swedish company. The three-seat SAAB Safir is a popular visitor to this country at the present time, and on p. 515 is a photograph of the Scandia 90A twin-engined transport. In addition to these two the company produce the Model 17 single-engine dive bomber and reconnaissance aircraft, the 18B twin medium bomber, the 21A single-seat, twin boom pusher fighter, and its later development the 21R jet fighter.

During the evening Mr. Johnson spoke of SAAB organization and activities and showed a very interesting sound film.

THE LEVRIERO

ONE of the newest of several modern Italian aircraft is the QR14 Levriero, powered by two Gipsy Major 10 engines driving D.H. controllable-pitch airscrews. A four-seater, it is said to have ample luggage space and to allow an excellent field of view.

Data are: Span 41ft, length 32.8ft, weight empty 2,870 lb, gross weight 4,190 lb, max. speed 192 m.p.h., range at 155 m.p.h., 680 miles.

PRIVATE FLYING (*Continued from page 520*)

Hourly Flying Costs (varying directly with hours flown).

	s.	d.
Fuel and Oil	7	0
Inspection of aircraft and engine	5	0
Maintenance	3	0
Spares	2	6
Telephone (Met., landing, etc.)	0	6
Total Hourly Costs (varying with hours flown)	18	0

Total Cost per Year and Hour (Privately owned).

Flying hours per annum	Annual cost £	Hourly cost £ s. d.
100	627	6 2 6
200	717	3 11 7
500	957	1 19 6

There are two ways of spreading the operating costs to reduce their impact on individual pockets. The first of these is through a pool of private owners—some half-dozen part-owners banding together to share one aircraft. The second is through the flying club or Air Centre. Unfortunately experience in the United States, where such pooling of private ownership has been tried on a wide scale, has shown that the system does not work well in practice. For non-business flying the most satisfactory solution is undoubtedly the flying club.

Summarized Costs for Club Operations

Comparative Figures.—Estimates have been made for the comparative costs of operating an efficiently run fleet of three club aircraft costing respectively £800 and £1,000 each. Costs for the aircraft costing £1,000 each are shown in the table.

Conclusions

Utilization is of primary importance and to obtain cheap flying it is essential to obtain as many flying hours per year as possible.

Next in order of importance in club operation is number of aircraft operated.

Formulae—Operating costs of I.L.A.C. Type 1 Aircraft

	£ per hour/aircraft	
	Club	Private Owner
Depreciation	0.18 c/u	0.18 c/u
Insurance	0.10 c/u	0.10 c/u
Interest on capital invested	—	—
General aircraft spares	0.11	0.125
Engine overhaul	0.15	0.15
Fuel cost	0.35 to 0.45	0.35 to 0.45
Flying personnel	750/un+0.62	—
C of A	5/u	5/u
C of A overhaul	55/u	122/u
Hangarage	Overhead= 380/u+167 n	70/u
Landing fees		10/u
Telephones		0.025
50-hour inspection	8	0.25
Sundries		50/u
Non-flying personnel	920/un+0.22	—

c is the aircraft first cost complete (£). u is the yearly utilization per aircraft (hours). n is the number of aircraft.

For small numbers overall costs are high. There appears to be little saving, however, for clubs operating more than 10 to 15 aircraft.

Aircraft first cost has only a small effect on overall operating cost at utilizations of more than 500 hours per year per aircraft. For smaller utilization first cost becomes increasingly important.

Overall hourly operating costs of a privately owned aircraft are less, at the same utilization, than for a club-operated machine. Calculations suggest that the minimum annual expense to the private owner will be in the neighbourhood of £600 for the type of aircraft considered.

These formulæ, when summed for club use, become:—

	Less than 500 hours utilization	More than 500 hours utilization
Cost less than £1,000	1.45+0.28 c/u+ 227/u+2050/un	0.83+0.28 c/u+ 537/u+2050/un
Cost greater than £1,000	1.43+0.28 c/u+ 216/u+2050/un	0.81+0.28 c/u+ 526/u+2050/un

For the private owner these become: Cost= 0.28 c/u+257/u + 0.9£/hr.

The hourly cost for the £1,000 aircraft, split into its components, are plotted in the graph Labour costs are found to constitute the major portion of the maintenance costs, which are of the order of one-third to one-quarter of the total hourly costs, so that design for easy maintenance can have appreciable effect on hourly operating costs.

CIVIL AVIATION NEWS

I.N.A. Jhelum: One of the fleet of six Vikings owned by Indian National Airways. Each is named after an Indian river, and they have been operating on the Delhi-Calcutta route, flying the 800-mile journey in 3¾ hours. A new daily service between Calcutta and Rangoon started on November 1st.

Tudor Questions in Parliament : FIDO Operating Regulations : B.E.A. Relieved of Some Priorities : New Swiss Airport

BRITISH AIRLINE PILOTS' SALARIES

SALARIES and pensions for pilots in the service of the three British Corporations have been discussed by the Industrial Court, and the award was announced at the meeting of the Court on October 16th. The British Airline Pilots' Association made a case for an increase in the daily overseas travelling allowance, the retention of North Atlantic pay, and a common salary scale for the three British airline Corporations. The award has been made without prejudice to any higher salaries or better conditions at present in force and has taken note of the promise of the Minister of Civil Aviation and the Corporations in relation to the pension scheme. It has not awarded everything asked for by the Association, but certain improvements have been effected in the salary and pensions structure. It is consequently a compromise, but it represents a tidier structure than its predecessor and there is now an orderly progression in salary from one grade or rank of pilot to another. The salary structure for pilots provides for five ranks or grades of officers, whose scales of salary exclusive of pension contributions and annual increments shall be as follows:—

Minimum		*Increment*		*Maximum*
£600	×	£25	—	£700
£750	×	£25	—	£900
£1,000	×	£45	—	£1,180
£1,200	×	£50	—	£1,480
£1,500	×	£50	—	£1,650

The Corporations retain the right to determine the rank or grade and the point in the salary scale for such rank or grade to which entrants may be appointed or officers already in post may be promoted. On the subject of pensions and insurances, the award states that the Corporations shall establish a Joint Pension and Insurance Scheme and the rates of annual contributions shall be related to the salary. The amounts of pension payable and the retiring age are to vary with the age of entry, but shall be based upon the right of a pilot entering the service of the Corporation up to the age of 30 years, and otherwise entitled under the scheme, to receive a pension of £350 per annum at 40 rising to £650 per annum at 50.

The overseas allowance of 15s per day for Captains and 11s per day for First and Second Officers employed by B.O.A.C. is to be continued and extended to officers of similar rank in B.S.A.A.C. who, had they been in the service of B.O.A.C., would have qualified. Pilots employed by B.E.A. will still receive a daily travelling allowance of 4s whilst on service outside the United Kingdom and within the confines of Europe. The special North Atlantic pay is still to be confined to pilots on the North Atlantic routes, and will not be extended to other trans-oceanic routes. The pension scheme will date from August 1st, 1946, and the new salary structure from June 1st, 1947.

TUDOR QUESTIONS

IN the House of Commons on October 29th, the Parliamentary Secretary to the Ministry of Civil Aviation was asked several questions by Mr. Leslie Hale in connection with the Tudor I. Mr. Lindgren, in reply, said that it was impossible to state precisely the number of alterations to the Tudor I made at the request of B.O.A.C. He did reveal, however, that in February, 1946, the Corporation suggested 343 modifications, 123 of which were to be embodied in the aircraft before delivery and 210 at the earliest convenient time after delivery. The remaining 10 were not essential for the Tudor I, but were for the Tudor II. Mr. Lindgren also disclosed the reasons for the B.O.A.C. trial flight to Nairobi. The Tudor I aircraft G-AGRD was delivered to the B.O.A.C. development flight in November, 1946. North Atlantic weather being unsuitable for test flying in the winter, it was agreed by the Minister of Civil Aviation, the Minister of Supply, and B.O.A.C. that the aircraft should be flown to Cairo to obtain adequate performance data, under reliable weather conditions, at the earliest opportunity. The Ministry of Supply having asked for the co-operation of B.O.A.C. in a programme of take-off tests in tropical conditions, it was agreed that the tests already contemplated should be extended to include Nairobi, and the tests assumed additional importance in view of the possibility of using Tudor I aircraft on the South African route.

CARDIFF—BRISTOL—WESTON

THE Parliamentary Secretary stated in the House on October 29th that the air services between Bristol and Cardiff, Cardiff and Weston had been discontinued because the heavy loss to the Corporation was no longer considered justifiable in view of the general economic situation. He further stated that so far as airfield landing charges were concerned, the statement to the Estimates Committee that charges on the Cardiff-Weston service represented 93 per cent of the expected revenue, was an inaccurate statement. The correct figure, he said, was 71 per cent. It is interesting to note that on the Cardiff-Bristol service during September, 753 seats were available of which 291 were occupied, a load factor of 36.8 per cent;

from Bristol to Cardiff the load factor was 41.1 per cent. On the Cardiff-Weston service 2,498 seats were available, 1,783 were occupied, representing 71.5 per cent load factor; in the opposite direction the load factor was 77 per cent. On the 20-minute service between Cardiff and Bristol there were five services a day in each direction. On the 15-minute service between Weston and Cardiff there were 23 services daily at half-hourly intervals. These figures are for the heavy tourist month of September and are not representative of a year's operation. The average over the past 8½ months is 50 to 55 per cent, and it was upon the expected revenue from that average that the figure 93 per cent was quoted. The fare between Weston and Cardiff was 9s single. Each Rapide carried five passengers, and since the landing fee at each station was 25s, little was left for running costs.

FIDO ON PAYMENT

REGULATIONS governing the use of F.I.D.O. by civil aircraft have been published in a recent *Notice to Airmen*. The R.A.F. Station at Manston will provide facilities on a continuous 24-hour basis, for aircraft in two emergency conditions only: when owing to a sudden deterioration in weather an aircraft having passed its point of no return is unable to reach a fog-free airfield, and when an aircraft is in a state of emergency and must land quickly within a fog-affected area.

Since F.I.D.O. is to be regarded strictly as an emergency facility operators must not undertake flights that are unlikely to terminate at an airfield fit for visual approach or for normal instrument landing. No extra charge in addition to the landing fee for the airfield in question will be made when F.I.D.O. is used in cases of genuine emergency, but the Minister of Civil Aviation reserves the right to investigate each F.I.D.O. operation, and if in any particular case the emergency could have been avoided by sound planning or airmanship, the operator may be called upon to meet the full costs of the operation attributable to the incident. The warming-up period is calculated to cost £500 and each subsequent minute £250. Authority to order the lighting of F.I.D.O. has been vested in the Duty R.A.F. Controller at Uxbridge, and when it is required for civil aircraft a request must be made by the Duty Civil Controller through his R.A.F. counterpart.

Requests may be made by persons in command of aircraft in flight or by the representatives of operating companies through the normal channels to the Duty Civil Controller, Uxbridge who will decide if circumstances warrant each action.

F.I.D.O. should also be available at Blackbushe before the end of the year. Similar conditions will apply, but although cost is expected to be the same for the warming-up period, it will be approximately 50 per cent less for each subsequent minute. The authority for ordering the lighting of F.I.D.O. at Blackbushe has been vested in the Duty Civil Controller, Uxbridge. Pilots are warned that when flying in the area during F.I.D.O. operation, the glare from the installation may make instrument flying difficult, and it is recomended that another crew member should be detailed to read the air speed and altitude during the approach and touchdown. Approaches should be made five or ten miles faster than normal to counteract the slight turbulence encountered when entering the cleared approach area. The *Notice to Airmen* includes other useful information about the installations at Manston and Blackbushe.

PRIVATE FLYING IN U.S.

FIGURES recently disclosed by the American Air Transport Association show that in the first half of this year private, itinerant and local flights constituted 74.33 per cent of all aircraft movement at American airports with control towers, while commercial aircraft accounted for only 16.18 per cent; the remaining 9.49 per cent was made up of Army and Navy aircraft movements. An increase of 90.82 per cent over the 1946 period and a gain of over one million movements of all types of aircraft in that period were also shown.

PRIORITIES RELAXED

THE degree of control exercised by the Priorities Board on certain of B E.A.'s Continental services has been considerably relaxed since the Corporation's winter schedules came into operation last month. The Gibraltar service was released from priority control on October 4th, and the Rome and Ankara services were similarly released on October 14th. Only the Athens, Berlin and Vienna services are still restricted. On the Vienna service the Board previously controlled all the 90 seats available weekly, but now, 36 on the outward and 54 on the inward journeys will be available for normal passenger traffic. On the Berlin service, non-priority passengers now get 56 seats on outward and 42 on return journeys; and on the Athens service only 12 out of 42 outward and 14 out of 40 return seats are still controlled.

AIR TRAFFIC FLOW MAINTAINED

THE drop in air traffic at the end of the summer season has been less sharp this year than usual, as is witnessed by the following figures for September recently published by the Ministry of Civil Aviation. In a few cases an increase is recorded. At Northolt there were 2,609 aircraft movements

AIRLINE DISCUSSIONS: (Left) I.A.T.A. Traffic Conference leaders with Sir William Hildred (front, left) at Rio de Janeiro. Gordon R. McGregor, T.C.A.; (second row) Charles N. Biondi, Jr., Qantas; C. W. Nielson,; R. D. Stewart, B.O.A.C.; A. Laurence Young; (back row) W. M. Sheenan, I.A.T.A. Legal Drafting Officer; G. S. Leverton, South African Airways; Vladimir de Boursac; Rene Briend, Air France; and Rudolph Feick. (Below) The Executive Committee in session. (Left to right) John C. Cooper, Legal Adviser; Per A. Norlin, S.I.L.A.; Sir William P. Hildred, Director General, I.A.T.A.; Paulo Sampaio, Panair do Brasil, Chairman of the meeting; Major J. McCrindle, B.O.A.C.; Harold M. Bixby, P.A.W.A.; Dr. Albert Plesman, K.L.M.; and Rene Briend, Air France. Other members of the Committee are John E. Slater, A.O.A.; Dr. Hassan Sadek Pasha, Misr Airlines: A. F. T. Cambridge, Indian National Airways; and General T. H. Shen, China N.A.C.

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as against 2,784 in August, and 50,248 passengers were handled as against 51,880. The decrease in mail was from 147,182 lb to 139,049, and in freight from 594,331 to 582,145. There were 107 less arrivals and departures by foreign aircraft on scheduled services than in August and 68 less by British aircraft. At London Airport there were 2,091 aircraft movements, carrying a total of 36,562 passengers—an increase of 4,442 over August. The amount of mail carried also showed an increase by 51,154 to 488,198 lb. Freight, however, decreased from 830,127 lb to 731,476 lb. Similar slight decreases in traffic were experienced at Renfrew, with 13,037 passengers as opposed to 13,791 in August, and Belfast, with 12,009 passengers as against 14,121; but at Liverpool there was a steep rise in the number of passengers handled from 6,132 in August to 11,750 in September.

C.A.B. SUSPENSION ORDER

THE failure of certain American charter companies to file tariffs with the Civil Aeronautics Board is regarded by the Board as contributory to unsound economic conditions among charter operators, and to destructive competition in civil air transport. An Order has therefore been issued which automatically suspends the registration of all non-scheduled operators using large aircraft who have not filed appropriate tariffs covering their air transport services, or who have otherwise failed to comply with the requirements of the Civil Aeronautics Act. The Order became operative on October 18th.

ZURICH AIRPORT

THE Zurich-Dubendorf airport at present in use will eventually be replaced by the Zurich-Kloten airport, which will then become the intercontinental airport for Switzerland. The airport is situated about six miles from the centre of the city and has been planned to conform to I.C.A.O. Class B standards. There are to be three runways, each of which will be capable of future development for conversion of the airport to Class A. The land necessary for this has already been purchased. The runways and taxiways are to be built with concrete and strong enough for aircraft weights up to 300,000 lb. Taxi tracks will be finished in a dark colour. The apron will measure 1,160ft × 400ft and there is to be one building for the handling of passengers and another for the handling of cargo and mail. Adequate hangar accommodation is to be provided for airline, charter and private aircraft using the airport. The instrument runway is to have S.B.A. until equipment can be obtained for installing the Instrument Landing System. This runway and the approaches are to be fitted with high intensity lighting. Construction of the airport started in 1946 and it is hoped that one runway will be in operation by the spring of next year. As soon as the airport is ready for full operation, which it is hoped will be next autumn, all air traffic will be transferred from Dubendorf. Buildings will not be completed until the end of 1949.

BREVITIES

Mr. Arthur R. McComb, who has been connected with aviation in Australia for many years, has been appointed Deputy Secretary-General of I.C.A.O.

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It is understood that the Howard Hughes's 200-ton flying-boat has flown one mile at about 70 feet.

* * *

The Australian Commonwealth Government has allocated the sum of £11,600,000 for civil aviation this financial year, as against £4,400,000 last year.

* * *

Ethiopian Airways, an associate of T.W.A., began a new service last week from Lydda to Johannesburg via Jeddah, Port Sudan, Asmara, Addis Ababa and Nairobi. Passengers and freight will be carried on the route.

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The first B.S.A.A. regular schedule with the Tudor IV left London Airport last Friday. The service will operate through Lisbon, the Azores, Bermuda and Nassau to Cuba, and will leave London Airport each Thursday.

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It is expected that the £200 million cut in capital expenditure will put a stop to construction work on civil airfields, slow down work on the three runways at London airport, and stop all other work on airfields with the exception of safety and maintenance.

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Sleeping berths are now fitted to the Air France Constellations on their mid-week service New York-Paris and return. The supplementary rates charged for sleepers are £31 5s for a single berth and £37 10s for a double. Return fares are exactly double those of the single journey.

Applications from Italy and Austria for membership to I.C.A.O. have been approved by the U.N. General Assembly's Economic Committee.

* * *

Mr. G. Strauss, Minister of Supply, has stated that the assembly hall at Filton for the Brabazon I will cost about £2,300,000.

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An 800 yard extension to the main N.E./S.W. runway at Schiphol Airport was completed on October 21st. The runway now measures 2,500 yards.

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The total distance flown by the charter section of Airwork, Limited, during the month of September amounted to 55,320 miles, with passenger miles totalling 1,075,555.

* * *

The Pan-American Airways South Pacific route has been extended as far as Melbourne. Sydney, hitherto the terminal point, will henceforth be an intermediate station.

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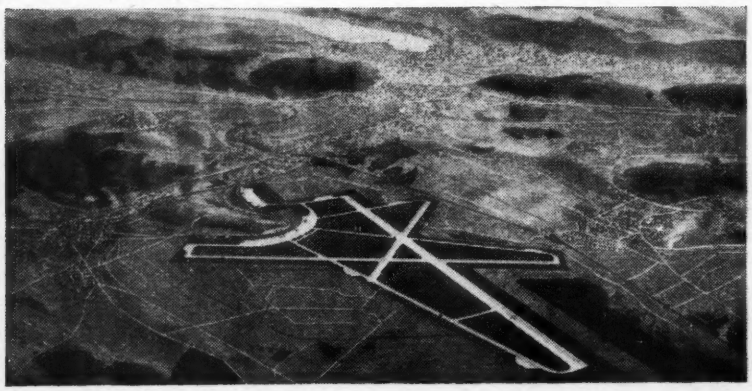
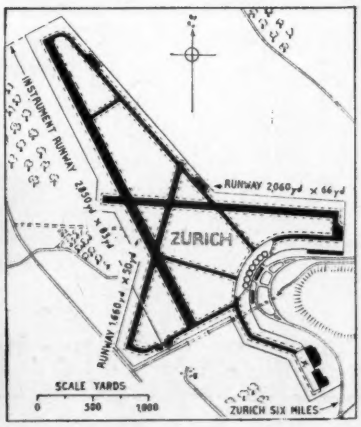
Plans for the development of Lydda Airport, started by Air Vice-Marshal S. E. Storrar, Palestine Director of Civil Aviation, are going ahead. The work, which involves enlargement of the terminal building to give greater accommodation for signals, control and meteorological departments, as well as





***AIRPORT FOR SWITZERLAND:** The new Zurich-Kloten airport lies to the north of the city. It will become an intercontinental Class B airport when completed, but may later be developed to a Class A airport.*

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additional passenger-handling space, has already begun, and is expected to be completed next spring.

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Trans-World Airlines has transferred its staff from Cairo to Palestine, and aircraft are now being serviced at Lydda Airport instead of at Farouk Field, owing to the outbreak of cholera in Egypt.

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It is understood that Mr. R. H. Fawcett has been appointed Adviser to the Director of Civil Aviation in Ethiopia. Mr. Fawcett is the owner of a flying school bearing his name in Ontario. His duties include the formation of government operated flying schools throughout the country.

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Pan American Airways completed 20 years of service last week. Since its first flight on October 28th, 1927, the Company has flown more than seven million passengers, has carried half a billion pounds of mail and express, and has made over 25,000 ocean crossings.

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Mr. Abel Shaban, head of the South African Alpha group, arrived in Palestine last month to investigate the possibility of a service which, it is stated, is planned to link Palestine with England, America and South Africa and which will be operated with Skymasters, Haltons, Yorks and Dakotas.

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The fourth Constellation ordered by Qantas Empire Airways arrived at Sydney on October 27th, 42 hr 39 min after leaving Burbank, California, thus breaking the trans-Pacific record for civil aircraft. The first Constellation for Qantas arrived at Sydney on October 14th.

* * *

I.C.A.O. have announced the following dates and locations for the Air Transport Committee's Divisional Meetings in 1948: Personnel Licensing (P.E.L.) on March 30th; Operations (Ops.) on September 8th; Airworthiness (Air.) on September 21st; the Aeronautical Maps and Charts (Map) on March 22nd. The first three will be held in Montreal, the last in Brussels.

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With effect from October 26th B.O.A.C. are introducing a new weekly Dakota service between the U.K. and Malta via Marseilles. The flight, involving 1,380 miles, is scheduled to take an overall time of nine hours. Fares will be £37 single and £67 return. This is the fourth B.O.A.C. Dakota service to pass through Malta, the others being to Cairo, Lydda and Beirut.

FIRST TRIALS : The Beaver photographed during its first trials from Toronto Bay, Canada. This seaplane has been built by the de Havilland Company in Canada, is powered by a P. and W. Wasp Junior, and has a cruising speed of 127 m.p.h.

The Ministry of Civil Aviation have announced the establishment of a Control Zone around the Channel Islands with effect from October 23rd from which, incidentally, Alderney has been omitted.

* * *

The Regional Office of K.L.M. is now in new premises at 196, Sloane Street, London, and the former administrative offices at 199, Sloane Street, are now used as the London freight station. Passenger handling will continue in the Passenger Air Terminal, 202/4, Sloane Street.

* * *

An analysis of 3,000 accidents in the United States shows that approximately 47 per cent occurred during landings, 20.7 per cent in flight, 18.7 per cent during take-off, 12.7 per cent while taxying, and the remaining 0.9 per cent from various causes whilst on the ground. The primary causes are attributed by the Civil Aeronautics Board Safety Bureau to pilot failure and weather conditions.

FROM THE CLUBS

Aero clubs in New Zealand have been authorized to operate charter, taxi and air ambulance services as sub-contractors to the National Airways Corporation.

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The New Zealand Government has presented 42 Tiger Moths to aero clubs in the Dominion, and the Cabinet has approved the training by these clubs of 150 A.T.C. cadets. Trainees, who will be selected by the R.N.Z.A.F., will get up to 30 hours' flying for which the Government will pay £4 an hour dual and £3 10s an hour solo. They are required to give an undertaking to remain a member of the A.T.C. until released by the Air Force.

* * *

At a recent committee meeting of the Coventry Aeroplane Club there was a general feeling of confidence that assistance would be forthcoming from the Kemsley Trust, and plans are being prepared to start a glider section of the club next year. The second Tiger Moth has recently been delivered. On Saturday, October 25th, members of the Flying Club, together with members of the Heart of England Branch of the Air League of the British Empire, visited the Armstrong Whitworth aircraft factory at Baginton. They were later entertained to tea by Mr. and Mrs. H. M. Woodhams.

* * *

Rochester Flying Club started in June this year with two Tiger Moths. Since that time membership has steadily increased to the present figure of 110, and the Club have found it necessary to purchase an Auster. The total flying hours now exceed 500, and members have obtained 20 "A" Licences and renewed 13 old ones; five "B" Licences have also been obtained and eight have been renewed. There has been some enthusiasm for night flying owing to the shortening hours of daylight, and a weekly programme of night flying is being planned. Flying rates have been reduced to £3 per hour for instruction and £2 15s per hour solo.

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Fog and high winds hindered flying activities at Luton Flying Club during October. Nevertheless, some 250 hours were completed. Three Tiger Moths, two Austers, and a Proctor were available for most of the month and the club has recently taken delivery of a Magister. Despite the prospect of transport difficulties, membership is increasing and 12 applicants were elected as full flying members at a recent meeting. Mr. S. E. Norman, one of the club's members, borrowed the club's Rapide to accompany him with his own aircraft, a Percival Q.6, to South Africa on a business visit. The club's C.F.I. is flying the Q.6 and it is understood they are making good progress along the route.

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The Royal Aero Club of New South Wales celebrated the completion of 21 years of flying training by an Air Display held at Bankstown on October 11th. The display was staged with the co-operation of the R.A.A F. and many of the civil operators, and gave the public of Sydney an opportunity of seeing modern civil and Service aircraft at close quarters and in the air. Forced landing technique was demonstrated, followed by aerobatics in which a Tiger Moth and a Slingsby Sailplane took part. Mustangs led a formation of Beaufighters, Lincolns, Dakotas and Wirraways. High lights of the occasion were a demonstration of vertical landings in an Autogyro, a descent by parachute, and the last flight of the "Southern Cross," the late Sir Charles Kingsford-Smith's aircraft. It is to be placed in the National Museum.

The club, which is proving very popular, has a fleet of 27 Tiger Moths, one Hornet Moth and one D.H. Dragon, and a steadily increasing membership which now totals nearly 700.

AIRCRAFT and the AIRWAYS

Outspoken Criticisms in Commonwealth and Empire Lecture

MR. JAMES T. BAIN, director of engineering and maintenance in Trans-Canada Air Lines, delivered the third British Commonwealth and Empire Lecture to the Royal Aeronautical Society on October 30th. Dr. Roxbee Cox, the Society's president, said that although Mr. Bain had come over from Canada to read the lecture, it was, perhaps, a little doubtful whether he should be called a Canadian, as he began his aeronautical career by serving for ten years in the R.A.F., after which he was with Hillman Airways, Spartan Airways and British Airways. As in the case of the other annual lecture, the Wilbur Wright Lecture, there would be no discussion, a fact which was, perhaps, unfortunate in this case.

The first part of Mr. Bain's lecture was devoted to a survey of the experience of the airlines on the North American continent. He chose those because he was most familiar with them, and because airline travel had developed on them to a greater degree than elsewhere, due to the great distances between centres of industry and population. The picture was not a happy one. The airlines had done more business during the past two years than ever before, but the gain had been offset by the increase in operating expenses. Accidents had had an effect on bookings. At present there was evidence of narrowly averted economic disaster throughout the aircraft industry. The lecturer thought there were many reasons for this poverty in spite of increased revenue, but that the outstanding one was basic unsuitability of present airline aircraft for any greatly expanded and accelerated job of work.

Present Airline Aircraft.—During the war the airlines did a magnificent job of work with the selfsame aircraft that had already served some years on the civil airlines. The great Allied transport commands used commandeered airline equipment, converted military types, and the airline aircraft which were in the final design stages in 1939. The latter were rushed to completion in military garb, and they ultimately became the backbone of all transport command services.

Post-war "Interim" Aircraft.—With the close of the war came a clamour for more aircraft for the airlines. Some figures of U.S. operators showed the expansion which took place. In 1946 the total revenue passenger-miles flown was 270 per cent of the totals for 1944. A conservative estimate for 1947 placed the expansion at 450 per cent of the same datum. Even these figures did not tell the whole story. In 1944 the payloads were in the region of 90 per cent of capacity. To-day the average payload factors were closer to 60 per cent, from which it could be deduced that the passenger miles available in 1947 showed an increase of 610 per cent compared with 1944.

Until late this year these tremendously expanded airline fleets were composed of makeshift conversions of military aircraft or airline aircraft ranging in design from eight to thirteen years' old. They were the same aircraft on which the pre-war airline industry was built.

> *AS a vehicle the present airline aircraft is sound and capable of reasonable success operated within its limitations.*

The "New" Aircraft.—The lecturer then examined the origin of the so-called new aircraft which were slowly finding their way into service. Over-zealous publicity men promised great new fleets of wondrous luxury aircraft, but those dreams of 1944 and 1945 had now vanished and reality showed an anti-climax in the form of the rehashed versions of pre-war designs or new models built along the same old design principles. Two major factors contributed to this result. The demand of the airlines forced manufacturers to promise new aircraft quickly and the manufacturers attempted to take full advantage of the tools and designs already in their plants. They did not take time to study the new airline pattern that had leaped into being after the war, nor the operational result which would attend the expanded fleets of larger aircraft when placed in operation on existing airway facilities, which, with but minor embellishments, were the same to-day as before the war. The lecturer repeated his statement that the "new" aircraft were new only in terms of production date, and there had been no fundamental advance in the principles of their design. He found it hard to believe that, taking into consideration new regulations such as "temperature accountability," these latest additions to the airline fleets would meet the requirements of their purchasers.

As a vehicle the present airline aircraft was sound and capable of reasonable success when carefully operated within its limitations. Handled properly on routes which provided the proper latitude, these tried and proved aircraft would do a fair and reliable job. Improperly handled, in an attempt to carry the expanded and accelerated traffic, they were basically unsuited for the job.

> *LACK of ability to maintain schedule is the greatest of all evils in airline travel.*

The Irregularities of Flight Operations.—The greatest of all evils in airline travel was the lack of ability to maintain schedule. Regularity was an almost all-embracing term, and there were few functions in airline operations which did not affect regularity of operation.

Aircraft must be built to meet the particular requirements of the route, the traffic and the type of operation. In the past the airlines had not collaborated sufficiently with the aircraft manufacturers. The inevitable result was aircraft unsuited to the airlines and requiring heavy and expensive modifications to make them usable in any degree. "Aircraft manufacturers," Mr. Bain said, "have no all-seeing crystal ball which will guide their design and development programmes; their job is building aircraft to suit the operator's requirements. It is only when properly advised by the operating men that the manufacturers can produce aircraft which will satisfactorily fill their purpose."

Mr. Bain had strong views on the subject of weight and weight control. New aircraft had a habit of coming out much heavier than the original estimate. It has almost come to be taken for granted that they would. That should be avoided. The importance to the operator of adhering to the original estimate would be realized if it was remembered that the loss of the equivalent of one passenger might make the difference between paying a profit and making a loss. If the return fare on a long route was, for instance, £150, and one multiplied that by seven days a week and by 52 weeks a year, the loss in revenue was enough to have paid for the avoidance of the extra weight by better weight control.

> *SPEED alone is responsible for the creation, existence and tolerance of airlines.*

Speed of Flight.—Speed of transportation, and speed alone, was responsible for the creation, existence and tolerance of the airlines. Without it they had nothing. Other things remaining equal, the greater the speed of airline travel the greater would be the reward.

Over areas adequately served by surface transport the speed advantage of aircraft decreased with journey length. In spite of this no minimum airline journey length could be arbitrarily set, as this was governed by local stage-to-stage conditions. Trans-Canada Air Lines' domestic routes totalled 8,183 miles, but the length of a passenger journey averaged only 536 miles. For every passenger who flew from Montreal to Vancouver, there were fourteeen who flew between Montreal and Toronto. The greatest demand for transportation was over the short distances between adjacent populated areas, and it was for these short distances that the present airline was of least value.

Advantages of Increased Speed.—Mr. Bain listed as follows some of the advantages that accrued to the airline operator from increased speed.

"1. The faster an aircraft can fly, the more units of work it can produce for every hour in the air.

"2. By increasing the units of work produced per hour flown, fewer aircraft will be required. Thus, an increase in speed will save on initial capital expenditures.

"3. With each improvement in speed, so will the speed of disposition be proportionately improved. With better speed of disposition, fewer spare or standby aircraft will be required, thus again saving on initial capital expenditures.

"4. The faster an aircraft can travel from point to point, so will the inaccuracies of weather forecasting be reduced. If the speed of the aircraft is doubled, then the

Aircraft and the Airways . . . . .

possibility of weather delay due to inaccurate forecasting is very appreciably reduced. Thus can be obtained an immediate and substantial improvement in regularity. Greater regularity will, in turn, induce more traffic and permit a higher percentage of direct flights. This could only result in increased revenue and decreased operating costs.

"5. The shorter the time taken to complete a journey, the less will be the many incidental costs of meal services, hotel accommodation for delayed passengers, crew layovers away from base, etc.

"6. The combination of increased speed of disposition, greater regularity and the potentially greater traffic volume will bring the airlines closer to the possibility of eliminating the necessity of reservations for single-stage journeys."

By way of illustrating the effect of speed increase on cost of operation, Mr. Bain took operating costs as being those directly proportional to the number of hours flown (such as fuel, oil, flight crew, overhaul, etc.) and indirect costs which remain constant regardless of the number of hours flown (such as depreciation of aircraft and ground equipment, hangars, traffic department, etc.). With existing airline aircraft the direct and indirect operating costs were each roughly 50 per cent of the total when the utilization of the aircraft was about ten hours per day. If the rate of producing work of the aircraft was doubled by doubling the speed, then the original amount of work could be produced by halving the number of aircraft. By halving the number of aircraft the major portion of the indirect costs was also cut in half. This meant that the same amount of revenue could be produced at a lower total operating cost.

AIRLINES have attempted to confound critics by publishing defensive statistics.

Regularity of Flight Operations and Safety.—The lecturer then recalled the series of major airline accidents which occurred last winter. These had left in the minds of thousands of potential air travellers the impression that flying was not safe. Each accident was wrapped in a shroud of secrecy, which was not removed until the incident had faded completely from the public mind. If free and open discussion of the cause of the accident and the correction which had been applied were released while the incident was still fresh, the airlines would have gone a long way towards giving their customers the necessary reassurance. The airlines had attempted to confound the critics by publishing defensive statistics, and powerful investigation committees had been set up, but the lecturer doubted that these would get down to the real roots of air accidents.

Mr. Bain said that in selecting the heading for this section of his lecture he deliberately combined regularity and safety. In his opinion the two were almost synonymous. There could be no true regularity unless it was regularity with safety, and it was failure to recognize this basic principle which kept regularity indifferent and the accident rate too high. To prove his point he went back a little in airline history. In the early days everything about aircraft was rudimentary and operation was stopped when it was not possible to see the ground. Succeeding years saw the rapid development of the first true airline aircraft. Great strides were made in the reliability of engines and airframes, and the development of radio and precision instruments made it possible to navigate without visual contact with the ground. New problems such as icing, static and storm were studied, understood and beaten by new equipment.

NEW techniques, procedures and additional gadgets have been added, beyond the ability of any human being to interpret and control.

That was roughly the position in 1940, and now wartime research had provided the basic information from which could be obtained the answer to the remaining problems to the true all-weather airline. But somewhere along that road of progress an essential turning had been missed. We were not progressing any more. Airline procedures which had been developed to give regularity of operation had gone beyond the point where regularity and safety went forward together. We were now striving for regularity at the expense of safety. In the course of developing airline aircraft there had been added new techniques, procedures and additional gadgets beyond the ability of any human being to interpret and control. No further addition of procedure or gadget could correct this condition, nor could additional crew members relieve the situation. To get back on the correct road we must eliminate the human element, with its limited and slow power of co-ordination from the purely mechanical job of flying and controlling an aircraft.

With the expansion and acceleration of airline traffic that had already taken place at some of the cities in the U.S.A., each minor weather delay caused the "stacking" of flights above the airport, sometimes for hours waiting their turn to land. Complete automatic control was not impossible, and if the airlines and their respective governments would adopt the principle of automatic flight control, aggressively pursue it with complete achievement of their goal, then the improvement in both regularity and safety would repay their investment many times over by increased revenue.

ONE could become very despondent about the future airlines were it not for statistical facts.

The Air Traveller's Point of View.—The air traveller of to-day was becoming more and more impatient with the multitude of irritations and delays which might beset his journey. Among these Mr. Bain listed the annoyance of picking up the ticket far ahead of departure time; the fuss over baggage and checking in; the waiting for the departure; the service delays, connection delays, loading delays, weather delays and mechanical delays; the supreme affront of cancelled flights or the final bogging down at some alternate airport miles from the proper destination. All these added up to account for quite a percentage of the empty seats. One could become very despondent about the future of the airlines if it were not for the statistical facts of the yearly increases in air traffic, which proved what could be expected when the bad conditions were corrected—and corrected they most assuredly would be.

The Aircraft on the Ground.—Mr. Bain said it had long been his desire to have one of the designers of airline aircraft spend a week on the departure ramp at an airline station. He was sure that at the end of that time the designer would thoroughly appreciate that it took more than a knowledge of aerodynamics to design a good airline aircraft. He would soon understand why the lack of facilities of the aircraft for ground handling could completely destroy the value of excellent flying characteristics. Mr. Bain listed, as follows, some of the things the designer would learn:—

(a) With present designs of cargo compartments, it took a three-man crew fourteen minutes to unload 1,000lb of cargo, and it might take twice as long if it was a mixed cargo of mail, express and baggage, that needed sorting out. Domestic aircraft must have roomy cargo compartments, accessible in flight, to permit pre-sorting of the load for the next station.

(b) C.g. travel was altogether too critical and a much wider range must be provided to facilitate loading.

(c) One cabin door was not sufficient for loading and unloading passengers and for the commissary, food service and the cabin cleaning crew.

(d) It must be made unnecessary to work through any cargo or other compartment to get at the radio, electrical, instrument or accessory equipment. These must be immediately accessible by the simple removal of a covering panel and must be arranged to permit easy removal and rapid replacement.

(e) Fuel tanks must be capable of accepting high rates of flow, and oil tanks must be easily filled without complicated filler funnels. There must be facilities for the flushing of toilets and replenishing of water; alcohol, oxygen, fire extinguisher and hydraulic supplies must be suitably arranged for external servicing.

(f) Provision must be made for complete cabin air-conditioning by the use of an external power source.

Lack of proper aircraft facilities for ground handling represented a major operating cost increase which could easily be eliminated by thoroughly understanding all the details of the proposed operation before even the writing of the specification started.

Canadian Developments.—Mr. Bain recalled that in 1942 his firm started the preparation of a specification for post-war transports. To-day the preliminary version of that aircraft had seen several highly successful months of service on the North Atlantic. Due to a lack of design ability, a lack which had

(*Continued on page* 533)

Operation "New Horizon"

Ontario Government's Scheme of Air Immigration from Britain

By SPENCER SWAFFER*

BORN from experience in air-trooping, when masses of men were transported to battle zones over vast distances, comes mass civilian air transportation, from continent to continent, necessitated by shipping shortages and the ever-present modern wish to get somewhere quickly. The Empire spotlight is focused on the Ontario Government scheme for the immigration, by air transport, of 7,000 Britons seeking opportunity and a new way of life in Canada, whose potential wealth is unscratched and whose cities are unscathed by the ravages of war.

First load of airborne "Mayflower" migrants took off from Northolt airport early in August and landed at Malton, near Toronto, with intermediate stops at Shannon, Ireland, and Gander, Newfoundland. That only a minute proportion of the passengers have ever flown before is an indication of the public's faith in this modern mode of travel.

In the initial stages of the scheme, three Skymasters a week were carrying 40 passengers per trip, but this has been increased to 43 aircraft per month, some of them departing from Prestwick airport to take care of the many Scottish emigrants. Just over three thousand have departed since the inauguration, and it is expected that the balance of nearly four thousand will certainly be eating their Christmas dinner somewhere in Ontario. These will all have flown from Great Britain, and will include 3,500 from London and the South of England; 2,000 from the Midlands; and 1,500 from the North of England and Scotland. All but less than 1 per cent of those already in Canada have been fixed in suitable occupations, 90 per cent of them within 36 hours of landing.

* *The writer of this article flew to Toronto in one of the aircraft in order to see for himself how the immigrants took to air travel.*

MAKING FURTHER ENQUIRIES. A queue outside Canada House in Cockspur Street. When tickets have been obtained, the passengers are transported to Northolt by Hunting Air Travel.

INTEREST AROUSED. Potential air immigrants studying the poster in London.

The contract for this epoch-making air move is between the Government of Ontario and Trans-Canada Airlines, but many other organizations contribute to the success of it. For instance, the sale of tickets is handled by E. A. Gibson & Co., shipping and aircraft brokers, who were freighting across the Atlantic in sailing vessels as long ago as 1800. Then Hunting Air Travel Ltd. weigh-in the passengers and baggage and arrange for transport to Northolt. Here they are taken over by officials of British European Airways, who shepherd them through Customs and emigration authorities. The biggest burden of all is carried on the broad shoulders of Transocean Airlines of California, who supply the Skymasters and the personnel to fly them under sub-contract to Trans-Canada.

Anglo-American Co-operation

Transocean Airlines have a good record of safety and can be well entrusted with the care of our emigrants. Their fleet, which is being rapidly expanded, comprises fourteen D.C.4 Skymasters and a modified luxury B17 Flying Fortress. They employ British, American and Canadian staff, and the man to pilot the first consignment of emigrants was Captain M. "Johnny" Griggs, former test pilot for the Ministry of Aircraft Production under Lord Beaverbrook, and later a Group Captain with R.A.F. Transport Command. On my return journey Captain Marvin C. Staddon, an American who joined the Royal Canadian Air Force, was making his 79th crossing of the Atlantic.

Transocean have no franchise to run a scheduled service to Great Britain, but they operate a bi-weekly service from Oakland, California, to Calcutta, Bangkok and Shanghai. On the return journey from Toronto, via New York, they carry freight, thus ensuring a pay load for the eastern part of the journey. Amongst other things, the Skymaster in which I returned carried a complete knocked-down Beechcraft Bonanza destined to a customer in France.

As an air charter company Transocean Airlines have undertaken some queer missions. One hundred displaced Polish girls were flown from Frankfurt to the Dionne Mills in Canada, saving considerable time and wages. They also flew 8,000 labourers from the United States to work in the torrid, damp atmosphere of Guam. The fact that some of these men were paid up to eight hundred dollars a month, which included time in transit, gives some idea of the great saving in wages as against travelling by sea. In other operations whole ships' crews have been flown across the Atlantic to take delivery of shipping transferred from one owner to another.

In addition to their military operations, when they flew 2,408,492 air miles under contract to the American Air Transport Company without injury to passenger or crew or

damage to aircraft, they have conducted Trans-Pacific commercial contract operations to Tinian, Manila, Shanghai, Hong Kong, Saigon, Singapore, Batavia, and Australia destinations. Again two and a half million miles were flown with a perfect safety record.

This airline is also at present assisting several U.S. government agencies in the development of aircraft landing aids, at the Landing Aids Experimental Station, Arcata, California. This includes the testing and development of high-intensity runway and approach lights, high-pressure fog dispersal systems, ground control approach and instrument-landing systems. As a result of these tests, the various sponsoring agencies will be able to determine, under scientifically controlled conditions, the most practical and efficient all-weather landing system.

ARRIVAL AT MALTON AIRPORT, TORONTO. The Canadian welcome is both warm and picturesque.

Most of the immigrants expressed great surprise that they were not being flown to Toronto by British aircraft manned by British crews. The answer is that Trans-Canada haven't the necessary equipment to spare at the moment, but a new aircraft is now being constructed, details of which have not yet been announced.* To ensure a reasonable pay load at £67 per passenger requires a 40-seater aircraft of great reliability, I am told. The Skymaster can remain aloft and make headway with two of its four engines out of commission. The immigrants expressed delight with the comfort of the fully-adjustable seats and the ability to converse freely in the air.

At Shannon airport a two-hour stop is made, during which hungry Britons can indulge in a large steak covered in fried eggs. Unused to so much rich food, passengers frequently request help from the stewardess in their sickness. Gander is the next stop, and there a generous helping of bacon and eggs is served in a comfortable restaurant.

At Malton airport, Toronto, the emigrants are quickly cleared through customs and immigration authorities, and taken over by members of the Canadian Red Cross and the Salvation Army. The seventeen miles to Toronto is covered in luxurious six-passenger limousines, and the emigrant never loses sight of his luggage. Once landed at Malton, the airline's responsibility ceases, and the passengers depart for the reception centre where they are fed and given a bed for the night, followed the next morning by kind and efficient assistance in securing a suitable job and permanent living quarters.

Trans-Canada's contract with Transocean specifically states that the latter shall not carry passengers between Toronto and the United States, and this clause is jealously guarded. Consequently the empty Skymaster with 40 seats vacant takes off for New York for inspection and the loading of freight for the return journey, with only the crew of six or seven aboard. A great pity this waste of 3¾ air hours cannot be overcome, if only for the mutual regard of one airline for another. It proved the only aggravating point in my journey.

** Reference to this aircraft, which is being built by A. V. Roe (Canada) Ltd., and will be powered by Rolls-Royce j.t engines, was made by Mr. James T. Bain in his British Commonwealth and Empire Lecture to the Royal Aeronautical Society, reported in this issue.*—ED.

AIRCRAFT and the AIRWAYS

(*Continued from page 531*)

now been rectified, they were unable to start from scratch and build the machine they wanted, but they had succeeded in some degree in applying some of the principles he had mentioned. In the *North Star* they had taken simplification of the pilot's duties and automatic control as far as present airway facilities would permit. One example of this was the Rolls-Royce Mk. 620 power plant. With the co-operation and guidance of Rolls-Royce, Ltd., they had succeeded in making all engine controls entirely automatic, thus greatly simplifying the cockpit control. The Hamilton Standard airscrews were controlled by a single lever, and provision had been made for eventually hooking up the automatic pilot, the aircraft controls and the power plants for operation by radio control.

As an example of how operations had grown and improved by the introduction of the DC-4M Mr. Bain mentioned that the present figure was 14 flights per week, using six aircraft; that operational economy had greatly improved; and that for the Rolls-Royce engines a period of 1,000 hours between overhauls was in sight.

The internal domestic and trans-border flight equipment operated well within the limits dictated by safety and the type of operation. In the immediate future all main line services would be operated with pressurized *North Star* aircraft, which would easily maintain Canada's competitive position. However, they were still not satisfied, and after careful consideration the Ministers of Canada's Government had approved a development programme for an advanced passenger transport. Details of the specification had not yet been released but construction of the prototype was now well advanced at the Toronto plant of A. V. Roe (Canada), Ltd., and orders had been placed for the Rolls-Royce jet engines.

In proposing a vote of thanks, Sir Frederick Handley Page said it had been a pleasure to listen to such a stimulating lecture, and it was refreshing to listen to a man who was not afraid of speaking his mind. Mr. Bain had referred to the importance of close co-operation between manufacturer and operator, and if only the designers would be guided by the far-seeing operators they would be on the right road. Perhaps it did not always work out that way. Sometimes it seemed rather as if the operator led the designer up the garden path.

Mr. N. E. Rowe recalled that he had spent some time with Mr. Bain in Canada last year and had seen something of the DC-4M and its production. He had been very impressed by the enthusiasm shown everywhere, and he thought much of the credit for the success of the DC-4M must go to Mr. Bain.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

WOMEN PILOTS

Volunteer Reserve Employ Non-operational Pilots Instead?

WHY this senseless idea of forming a volunteer reserve of women pilots for ferrying and communication duties in case of an emergency? There will be more than enough men available for this kind of work who have sound experience in the R.A.F. and past the age limit for operational duties.

As far as invention is concerned, women have not contributed one atom towards developing the aeroplane. As for women's work in the A.T.A., it could have been more efficiently done by men unfit for operational duties.

L. HEATHER.

THE FLYING BOAT

Capt. Brice Replies to Criticisms

A FEW weeks ago a twin-engined charter plane made a forced landing in a street on the Continent. The newspapers made the most of it, whilst the average person filed it away in his mind alongside the other remarkable events which occur from time to time. Nowhere, I noted, was the suggestion made that henceforth aircraft of this type could always make use of the highway when circumstances demanded it.

The *Sky Queen's* landing in the Atlantic was a feat of similar magnitude, but it has no place in a serious discussion on the flying boat. There have been other cases of flying boats landing in the open sea without sinking. A friend of mine in 204 Squadron accomplished it in a Sunderland, at night with a full Atlantic gale blowing, and stayed afloat for nine hours. But no one was more surprised than he, and, I venture to suggest, Messrs. Short Bros.

I do not regard it as unfortunate or amusing that I should have selected the Boeing A314 for my arguments about maximum swell conditions. The figures I gave were based on the makers' recommendations. One pilot who disregarded them and endeavoured to cope with an 8-ft swell did serious structural damage to his plane.

The *Sky Queen's* landing was accomplished for two reasons. First, because the wind velocity was such that the landing speed in relation to the sea was very low, and secondly, because the sea was of such proportions that no swell existed in the normal sense of the word.

The good humoured jibe in the telegram from Cowes would have been of more interest if it had included the swell limitation for the new Saunders-Roe flying boat.

My point about airfields was that you *can* build a runway stressed to take a 200-ton plane, and within reason you can put it where you want. And I, like most operators and aircraft manufacturers, believe that, whatever the cost, such runways will be built if airline traffic demands that such aircraft exist. It has *yet* to be proved, as I said before, that you can construct an artificial flying boat base, and if this cannot be done there are going to be very few areas of heavy traffic density which can be served by the flying boat.

DAVID BRICE.

A Former Enthusiast Recants

I SHOULD just like to write and tell you how refreshing it is to read in your paper Capt. Brice's article "debunking" flying boats. As you mention in your editorial omment, everybody should be allowed space to put his point of view, but I do feel that *Flight*, in its continued advocacy of the flying boat, has rather tended to claim for it a larger number of virtues than it has ever been proved to possess.

As one who commenced his airline career dealing with "C"-Class flying boats, the writer has a strong sentimental attachment to that excellent aircraft, and five years ago would have been indignant at the suggestion that any landplane conceived by man could successfully replace it. Subsequent experience in station-managing both flying boat and landplane stations, however, has shown me quite clearly on which side the force of argument lies. Capt. Brice has very plainly put his finger on the most striking of the flying boat's disadvantages: the difficulty of arranging suitable alternates, and it was interesting to hear one of B.O.A.C.'s senior executives (himself "brought up" on flying boats), makes exactly this criticism.

But I can testify from experience that the ground organization of flying boat stations is in itself so much of an unnecessary headache that only the most overwhelming advantages in operating economy and passenger preference could justify the use of boats instead of wheeled aircraft. For some reason, the maintenance of motor launches and their auxiliaries seems always so much more difficult than that of land vehicles—and you have to have land vehicles *as well* on a flying boat station. There is the problem of keeping your mooring buoys afloat and seeing that the alighting area is clear of flotsam and jetsam, and keeping your launches from bashing a hole in the flying boat's side every now and again—or knocking off a float. Once in a while some unfortunate sailor or mechanic will fall off the launch or the flying boat wing and drown himself. And if you have successfully loaded your passengers and cargo on the flying boat, then finding that the log book has been left behind, you do not just walk across the tarmac and get it. You have to send a launch for it.

All these things are details, you may say; and I quite agree that they might be overlooked if there were really strong economic arguments for the use of flying boats, or if passengers *really* liked them better! But in ten years of airline experience I have not yet heard a passenger say, "I prefer flying boats to landplanes." They may say, "We would rather fly in a Short flying boat than in a Lockheed Lodestar," but I never heard anyone admit to preferring a "C"-Class boat to the "E"-Class landplane. It is all a question of which flying boat you are comparing with which landplane.

In the last Brancker Memorial Lecture, Mr. John Booth remarked, "It is surprising to find that if there are two lines running the same route, one faster than the other, it is always the faster service which gets the bulk of the traffic." In view of this, and of the operational complications mentioned by Capt. Brice, and the niggling little nuisances which I have mentioned in this letter, is it surprising that the operations executives of B.O.A.C. (who, after all, know more about flying boat services than anybody anywhere) are not reputedly as keen on them as they once were?

By all means keep up your campaign in favour of boats—but do let the opposite view (which in my opinion has the right on its side) at least appear from time to time in your paper.

Rio de Janeiro, Brazil. E. P. JOHNSON.

AUTOMATIC PILOTING

A Denial of Complacency

WE have read with great interest the letter from "B-Licence Pilot" in your issue of October 23rd. As the designers of S.E.P.1, we share the view that great credit is due to our American friends for the work they have done in this field, and in particular their flight with the Skymaster.

Nevertheless, certain comments by your correspondent might be construed by your readers as decrying this first British electronic pilot, and we must disagree with some of his statements. First, "B-Licence Pilot" says that we, in this country, are yet far from achieving automatic flight from take-off to touch-down over long distances with standard ground equipment. We submit, in view of the intensive Government research at the Blind Landing Experimental Unit, and the success which has already attended their efforts, that such a pessimistic statement is unwarranted.

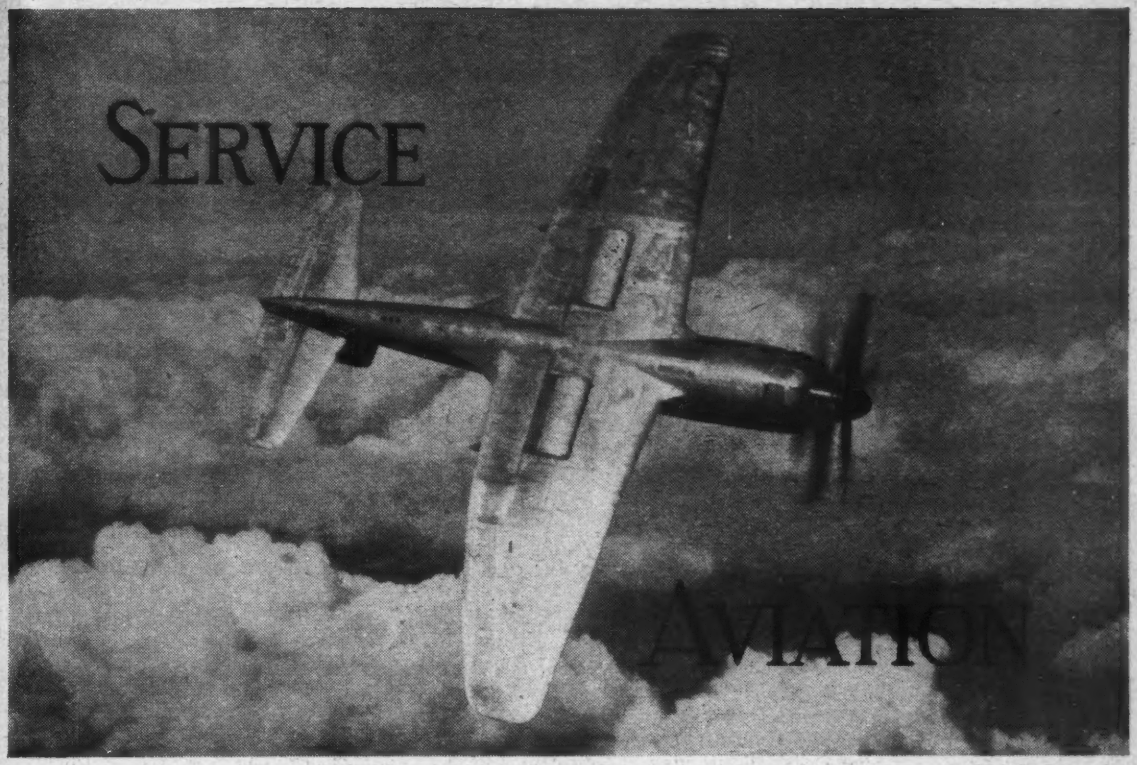
Secondly, in referring to flights from take-off to landing in zero/zero conditions, he says that these cannot be achieved with S.E.P.1 because it does not have altitude control or pitch trim control. Whilst we agree that these two features are attractive refinements, and we have already made provision for their incorporation to meet requests by potential users, we would point out that they are in no respect essential, as stated by "B-Licence Pilot," since the operation of passenger aircraft without crews is not contemplated.

Finally, the take-off and landing of passenger aircraft requires above everything a *safe* automatic pilot—which, in the event of any foreseeable failure, will not result in sudden or dangerous movements of the aircraft controls.

With due respect to contemporary designs, we submit that S.E.P.1 is the only commercial automatic pilot with this vital requirement, so on this score along you were justified in making the statement to which your correspondent takes exception.

We hasten to reassure "B-Licence Pilot" and all your readers that there is certainly no complacency in this organization. The further development of S.E.P.1 is being, and will be, vigorously pursued.

LEONARD MORGAN.
Director and General Manager.
Smiths Aircraft Instruments, Ltd.



"Flight" photograph

OVER THE SKY TO SEA: This new "Flight" view of the Westland Wyvern T.F.I. naval strike fighter (R.R. Eagle) shows how the characteristic plan form of the wing is reproduced in the horizontal tail surfaces. The location of the under-wing radiators is also apparent.

Defence Priorities

REPLYING to a debate on a Conservative amendment to the Address in reply to the King's speech, Mr. Alexander, Minister of Defence, listed the priorities for Britain's defence services as follows:

(i) Defence research.

(ii) Maintenance of the structure of the R.A.F. and its initial striking power.

(iii) Maintenance of sea communications and the most efficient Navy we can get in our circumstances.

Mr. Alexander added that the strength of the Auxiliary Air Force stood at present at nearly 1,800.

R.A.F. Appointment

THE Air Ministry announces the following R.A.F. appointment: A.V-M. Geoffrey Arthur Henzell Pidcock, C.B.E., to be Director-General of Armament, Air Ministry, as from October 14th, 1947.

A.V-M. Pidcock has been President of the Ordnance Board, Ministry of Supply, since August, 1945, having previously served for 20 months as its Vice-President. From February, 1942, until January, 1944, he was Director of Armament Development at the Ministry of Aircraft Production, and while holding that post

SALUTE TO TURKEY: A.V-M. S. C. Strafford, commanding a formation of six Lincolns of No. 101 Squadron, which has been visiting Turkey, salutes a Turkish guard of honour at Istanbul. Other places visited were Ankara, Eskizehir and Izmir.

Royal Air Force and Naval Aviation News and Announcements

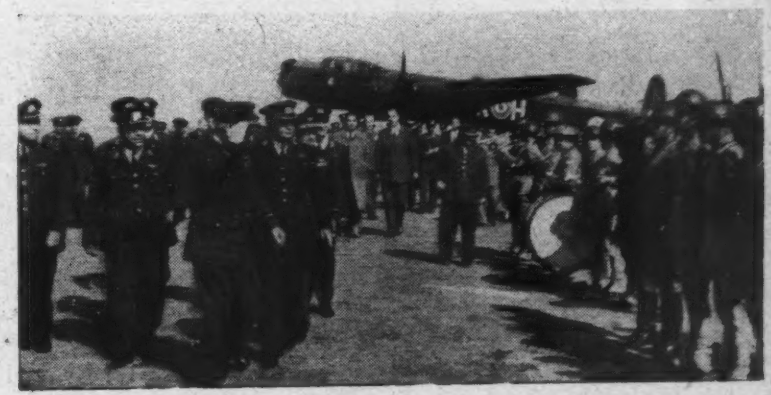
was connected with the introduction to the R.A.F. of a number of new weapons. These included rocket projectiles, the "tank-busting" Hurricane, the 6-pounder gun, the "Tallboy," and the "Grand Slam."

In the Blood

AIR CDRE. C. A. STEVENS, A.O.C. No. 28 Group, recently recalled making daylight photo-reconnaissance flights in a D.H.4 during the war before last. "They wanted to give me a fighter escort," he said "but I found that the fighters could not keep up with me." It is needless to recall that the D.H.4 was an ancestor of the Mosquito, a standard long-range P.R. aircraft of the present-day R.A.F.

French Squadron's Visit

A FRENCH Air Force squadron of ten Thunderbolts paid a liaison visit to the R.A.F. Fighter Command Station at Horsham St. Faith, Norfolk, from October 27th to 31st. The visit was one of a number which are being arranged on a reciprocal basis between the two Air Forces.



Service Aviation . . . . .

Spectacular Training

SPITFIRES, Mustangs and Corsairs of the British Commonwealth Air Forces demonstrated their striking-power in an exercise over the Japanese Inland Sea during September. The display was watched by Lt. Gen. E. C. Whitehead (Commanding General of the Far East Air Force, with Headquarters in Tokyo), Maj. Gen. K. B. Wolfe (Commanding General, 5th U.S. Air Force), Lt. Gen. H. C. H. Robertson (Commander-in-Chief, British Commonwealth Occupation Force), Lt. Gen. V. H. Sturdee (Chief of the General Staff, Australian Military Forces) and other high-ranking Allied commanders. The operation was under the command of Air Vice Marshal C. A. Bouchier, C.B., C.B.E., D.F.C. (A.O.C. B.C.A.I.R.).

The striking-force consisted of three squadrons of R.P.-firing Mustangs of the R.A.A.F., two squadrons of Spitfire fighter-bombers of the R.A.F. and one squadron of R.P.-firing and bomb-carrying Corsairs of the R.N.Z.A.F. Before the attack the aircraft flew in squadron formation over the Australian destroyer H.M.A.S. *Bataan* which had the C.-in-C. B.C.O.F. and Lt. Gen. Sturdee aboard. Then for 45 minutes high explosive bombs and rockets pounded the five targets set along the beaches of a small uninhabited island between Hiroshima and Miyajima. Spitfires opened the display with a bombing attack, after which they re-formed and dived to strafe a second target with 20 mm and 0.5 inch gun fire. Next the Corsairs attacked in a dive from 6,000 feet, and fired their rockets from a thousand yards. The first salvo struck the target, which burst into flames.

Forty-eight Mustangs now came in, each firing ten 60-lb high explosive R.P.s at Japanese landing barges, filled with contaminated fuel, beached on the foreshore. Direct hits soon caused the barges to explode and as rocket after rocket struck home, flames and smoke rose to 1,000 feet. Re-forming in sections of four the Mustangs dived on the island again and spattered the beaches and foothills with thousands of rounds of 0.5 inch machine gun ammunition.

The last attack was dive bombing by the New Zealand Corsairs. As the 500-lb bombs found their mark plumes of debris, rock and earth were flung skywards. Delayed action fuses on the bombs enabled aircraft to fly out of the danger area before the explosion.

LUNCH AT VALKENBURG: News that the Netherlands Air Force, like the R.A.F., is to adopt the Gloster Meteor IV as its standard interceptor, lends interest to this luncheon party at Valkenburg earlier this year. Mr. Eric Greenwood modestly effaces himself with blossoms. Next to him is Rear-Admiral M. de Vries, G/C. Heber-Percy and Mr. R. Harker. In the foreground is Flag Officer A. W. Witholt and on the right, partly visible, General J. J. C. P. Wilson.

Winter Trials

UNDER the command of Lt. Cdr. (P.) H. P. Leidl, Royal Canadian Navy, a combined Royal Navy and R.C.N. detachment is again testing modern first-line aircraft under severe winter conditions at the Winter Experimental Establishment, R.C.A.F. Station, Edmonton, Alberta. The programme opened on September 1st and will continue until spring. A Firefly IV, a Sea Fury and a Sea Hornet are the aircraft concerned. At Edmonton last year, in a temperature of 50 deg below zero, a Firefly I with a cold engine started with only one cartridge.

The combined R.N. and R.C.N. party at Edmonton is subject to purely Naval discipline and the Naval Division, *H.M.C.S. Nonsuch*, acts as the "mother ship." However, the party works in close co-operation with the R.C.A.F. and is under the general administration of the Air Force station.

P.R.O.s Gather

BY the end of the war Public Relations Officers of the R.A.F. had produced nearly 20,000 news stories, taken more than 44,000 photographs and 6,000,000 feet of film and produced pamphlets of which more than 10,000,000 copies were sold. These facts must have given great satisfaction to those who attended the first annual dinner of the Air Public Relations Association on October 18th. Lord Willoughby de Broke, former D.P.R. Air Ministry, gave the toast of the Air Ministry, to which Sir James Barnes, Permanent Under-Secretary of State, responded. Sir Arthur Street, wartime P.U.S. at the Air Ministry and now Vice-Chairman of the National Coal Board, also spoke. A message from Mr. Arthur Henderson, the newly appointed Secretary of State for Air, was read by the chairman, Air Chief Marshal Sir Philip Joubert. Another was received from Lord Tedder.

GENTLY DOES IT: S/L. White (right) of the R.A.F. Institute of Tropical Medicine and Pathology, supervises a demonstration of how an injured pilot should be extracted from a crashed Spitfire.

Reunions

ANY ex-members of No. 2 A.D.U. (M.E.) who were not present at the first reunion dinner on September 27th and would like to have news of any similar occasion should communicate with H. H. Wynn, 33, Darley Avenue, West Didsbury, Manchester, 20.

* * *

It is proposed to hold a reunion in London early in 1948 for members of No. 547 Squadron. Those interested are invited to write for details to F/O. J. W. Daley, R.A.F. Station, Defford, Worcestershire.